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PLANNING FOR SOLID WASTE MANAGEMENT

Symposium
of State and Interstate
Solid Waste Planning Agencies
September 9-11, 1969
St. Louis, Missouri

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ENVIRONMENTAL QUALITY—A NATIONAL GOAL

THE QUALITY OF OUR ENVIRONMENT can hardly be good if we let ourselves become inundated by oceans of waste. Yet solid waste presents us with a problem that is not easy to solve. In quantity, indestructability, and ugliness, these wastes constitute an overwhelming burden. In hazards to health, menace to welfare, and, of course, in sheer expense, they represent a source of nationwide concern. The problem and its consequences have both multiplied in size with our increase in population and advance in urbanization.

To aid our distressed cities and States, the Congress enacted the Solid Waste Disposal Act of 1965. The first grants became available to the States for the planning of solid waste management programs in June 1966. States have received planning grants from the Bureau of Solid Waste Management of the Public Health Service over a period of three years. In September 1969, the Bureau convened a meeting of the State and regional officials who have been developing such plans to assess the progress in planning and implementation of solid waste management programs. This volume contains the proceedings of that conference.

States that obtained their planning grants in 1967 and 1968 are obviously somewhat ahead of other States that were delayed in initiating their plans. However, the conference clearly shows that data have been collected, State plans outlined, and in some cases legislation enacted and implementation begun. The conference also brought out rather clearly the problems encountered and the lessons involved for future action.

It is significant that the name of the program and its identity have changed in the three-year period. The Act of 1965 is known as the Solid Waste Disposal Act, and the program that administered it was known as the Solid Wastes Program. Thereafter it was recognized that "disposal" was not the appropriate word to use, and the term "solid waste management" came into existence. The change in name is an important indication of a change in philosophy. We cannot today merely *dispose* of wastes—burning them pollutes the air; throwing them into oceans and rivers pollutes

the water and the shore; dumping them is ugly, unhealthy, and obviously self-limiting. Our watchword in planning must be *management,* so that wastes are used, reclaimed, recycled, even prevented.

While the name of the program was changing, a new national consciousness of the urgency of environmental control was emerging. In late 1970, by order of the President, the environmental programs of many Federal departments were combined in the Environmental Protection Agency, and Solid Waste Management became an Office in that agency.

The goal of environmental quality remains the preeminent consideration. The planning of solid waste management programs to help achieve that goal is clearly important. Therefore we are presenting the report of the planning symposium of September 1969, retaining the terminology then used. Although we now have a Solid Waste Management Office of the Environmental Protection Agency instead of a Bureau of Solid Waste Management of the Department of Health, Education, and Welfare, the purpose remains the same—achievement of environmental quality.

—RICHARD D. VAUGHAN
Deputy Assistant Administrator for Solid Waste Management

May 1971

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PLANNING FOR SOLID WASTE MANAGEMENT

Welcoming Address to the National Symposium of Planning Agencies

*Richard D. Vaughan**

Welcome to the National Symposium of State and Interstate Solid Waste Planning Agencies. This meeting is an important landmark. In September 1966, representatives of the solid waste planning agencies of our States met to discuss the conduct of a National Survey of Community Solid Waste Practices and to consider the development of comprehensive solid waste plans. At that time, our efforts in this field were just beginning, since the Solid Waste Disposal Act had been passed only a short time before (Public Law 89-272, October 1965). We can view with some satisfaction our progress in the brief period of three years, and we can now chart a course to finish the job.

This meeting includes invited representatives of present and potential recipients of grants from the Bureau of Solid Waste Management. There are now 48 political entities—States, territories, and regions—which have received matching grants and which are now proceeding with their solid waste planning. This Symposium, however, includes representatives from 47 of the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the territories of Guam and American Samoa, and 4 interstate agencies, even though some of these are not yet grant recipients. Such broad participation is an indication of the far-reaching significance of the solid waste problem. All the States recognize the need for planning to meet the problem, whether or not they have planning grants from the Bureau of Solid Waste Management.

The role of the Bureau of Solid Waste Management is a direct outgrowth of the Solid Waste Disposal Act of 1965. Participants in this Symposium are well aware of the Bureau's function in encouraging comprehensive solid waste planning through the grant mechanism, and I need hardly tell you about the problems of solid waste. The members of this Symposium know about these

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*Assistant Surgeon General, Acting Commissioner of Solid Waste Management Office, U. S. Environmental Protection Agency.

problems from first-hand experience. This group is "where the action is" in the continuing effort to properly manage mounting solid waste loads.

The purpose of the Symposium is to permit you to share your experiences with one another and with our staff. At the same time, we want to share with you some of our ideas, based on experience.

I am sure we all agree that any activity develops best when it is well planned. The need for planning is so important that Congress provided in the Solid Waste Disposal Act for matching grants to State and interstate agencies to encourage them to develop comprehensive plans for solid waste management. Congress recognized that control of solid wastes is primarily a State and local responsibility, and that the States need to plan for the proper management of this responsibility. Because planning is necessary, the Congress pledged funds for planning as the initial step in solid waste management.

What is a solid waste plan? How do you go about planning? How is a plan prepared? What data are necessary? How do you coordinate your plans with those of other government agencies? What kind of legislation should the plan call for? How are you going to see that counties and municipalities conform to the State plan? What provision needs to be made for updating the plan? And, most important, how are you going to gain the support of the people of your State to allow implementation of the plan?

These are some of the points to be discussed in this Symposium. This will be a working meeting in which every participant will contribute. We have five major fields for exploration: (1) the planning process; (2) data acquisition; (3) intergovernmental cooperation and public involvement; (4) legislation; and (5) implementation of the plan. An authority in each area, a person of broad experience—not necessarily acquainted with the detailed procedural concerns of grant operation—will keynote the discussion of each major topic. They will not talk procedures, but rather substance. Following each presentation, the Symposium participants will discuss the topic in small groups.

This Symposium has come none too soon. Most of the States are in their second or third year of survey and analysis preparatory to the development of effective plans. It is imperative that

we understand not only the planning process, but also the ingredients of a comprehensive solid waste management plan. Because the Federal program is comparatively new, we have not always been able to provide the necessary guidance early enough. In this Symposium, every representative should obtain a better understanding of what planning is and what a solid waste management plan should encompass. Since the delegates here are the working representatives of their agencies, what is learned here should have immediate application.

Keynote for our three-day session will be set forth by the Honorable J. Caleb Boggs who will share with us his views and knowledge based on his position as ranking minority member of the Subcommittee on Air and Water of the Senate Public Works Committee. Our speaker served as Representative-at-large for his State in the 80th, 81st, and 82nd Congresses. He was twice elected Governor of Delaware, and served as Chairman of the National Governors' Conference in 1959. The following year he was elected President of the Council of State Governments. Since 1960, he has served his State in the U.S. Senate. His vast experience in State and National government and his particular concern for the quality of our environment give him special competence in both planning and legislative implementation. It is with great pleasure that I present the Honorable J. Caleb Boggs, United States Senator from the State of Delaware.

AMERICA'S BIGGEST INDUSTRY: THE PRODUCTION OF WASTE

*J. Caleb Boggs**

I am extremely honored to join you today to participate in this important session to discuss a problem that affects every American as few other problems affect him—our national trash pile. The problem of our solid wastes is as crucial as any this nation faces in the latter third of the twentieth century. You are the men and women who will create and perfect the systems to free humanity from the burden of its discards. I see no more socially beneficial job than protecting and enhancing our environment—the job you are doing.

In the course of my preparation for this session, I checked the annual report on public works of a county in my home State of Delaware. The report discussed the trash collection problem and came to the conclusion that the mounting piles of rubbish in our nation will require that "more and more money and brains will have to be thrown into trash."

We seem to be following that prescription. Lots of brains are "going into trash"—the brains of planners, legislators and administrators. More money seems to be "going into trash," too. It remains to be seen whether we have put in enough brains or enough money.

I applaud the Bureau of Solid Waste Management for convening this National Symposium of State and Interstate Solid Waste Planning Agencies. And I must add that I am doubly delighted to know that my State of Delaware is so ably represented by Frederick Stiegler, of the State Board of Health.

Perhaps it would be helpful if I should tell you something of the way in which the Congress looks at our environment and the kinds of legislation we are discussing in an effort to enhance it. Such a viewpoint may be helpful to you as you discuss the topics listed in your programs.

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* U.S. Senator from Delaware, Member, Subcommittee on Air and Water, Senate Public Works Committee.

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I know you are familiar with the statistics on our national trash pile, but I believe they need to be reiterated regularly to make us constantly aware of the magnitude of the problem. The President's Science Advisory Committee found not long ago that "each year we must dispose of 48 billion cans, 26 billion bottles and jars, 65 billion metal and plastic caps and crowns, plus more than half a billion dollars worth of miscellaneous packaging material."

Waste is America's number one industry in terms of tonnage, for we produce far more tons of waste than we produce tons of steel or tons of cars or tons of any other product.

For each American we annually produce 13 tons of wastes of one sort or another. Put another way, we annually discard as unusable approximately 170 times our body weight in used soft-drink bottles, tailings from mining operations, junk cars, old newspapers, and other equally solid waste materials. As we grow more affluent, this tonnage mounts. We buy our soft drinks in disposable bottles and clothe our infants with throw-away diapers, adding new burdens to the Nation's disposal problem. We have become a society of discarders. Our improved technology taps lower grade ores, which create more waste for each ton of useful material. This expands our waste production at an almost geometric rate. And our discards pollute the environment as surely as DDT or auto exhaust.

The humorist, Art Buchwald, has imagined a glorious day when a spaceship from Venus might land in a desolate area identified on the Venusian space charts as "Manhattan." As the travelers from Venus examine the landscape, a professor radios the news back to his native planet: "We have come to the conclusion that there is no life on Earth," the professor says. "For one thing, the Earth's surface in the area of Manhattan is composed of solid concrete and nothing can grow there. For another, the atmosphere is filled with carbon monoxide and other deadly gases, and nobody could possibly breathe this air and survive."

Norman Cousins, the knowledgeable editor of the *Saturday Review*, recently sought to define the major problems confronting mankind. Peace is of course the first problem—the need for all peoples to get along together. A second problem is the need for man to control his environment, to preserve the air

he breathes, the water he drinks and the land he lives on so that he can live and can enjoy living. Mr. Cousins then made what I consider his major point—a most hopeful point—each of these problems is man-made, and therefore each must be within the reach of man's ability to solve.

President Nixon has shown his commitment to the eradication of environmental pollution through his creation of the cabinet-level Environmental Quality Council. That commitment to enhance our environment permeates the White House. The President's Science Advisor, Dr. Lee A. DuBridge, recently spoke of the need for the Council to find ways to improve cooperation between the Federal, State, and local governments for the best method of disposal of solid waste.

The enormity of this problem is great. The Congress, I believe, sees a need for action. That is why we in the Senate Public Works Committee are pressing forward on the proposed Resource Recovery Act, which is designed to improve and expand the 1965 Solid Waste Disposal Act. Similar legislation has been introduced in the House of Representatives.

The Solid Waste Disposal Act of 1965 authorized a research and development program aimed at providing new technology for collection and disposal of solid wastes. Grants have been made for State and interstate planning, interstate cooperation, research, demonstration, training, and other programs. Results thus far are promising, but under the 1965 Act no grants have been available for construction of facilities for disposal. This is in contrast to the National effort to combat water pollution which has provided construction grants to the States.

The major thrust of the first solid waste legislation was designed to provide the base for correcting the deficiences in existing systems and to develop new methods and techniques for collection and disposal of wastes. With the growing awareness of the extent of the problem, many of us have come to realize that simply extending and strengthening current systems will probably not provide the answer.

As a result, the pending legislation amending the Solid Waste Disposal Act would provide financial assistance for the construction of solid waste disposal facilities. It would provide grants for construction up to 25 percent for individual cities, or 50 percent for a regional facility. In addition, it would allow the Secretary of

Health, Education, and Welfare to increase the grant by half again as much—to 37½ percent for individual communities and 75 percent for regional facilities—where projects used new or improved technology.

Also significant is the bill's price tag—about $800,000,000 over five years. I consider that a sign that the Congress intends to take a major step toward ridding this nation of clutter.

Should this legislation pass, it might, of course, be affected by President Nixon's announcement on reducing construction projects. However, I feel confident that the Nixon administration is committed to environmental programs since the President exempted from the cutback, projects of "the highest social priority." I can think of no greater social priority than the protection of the environment in which we live.

The legislation, as planned, provides the opportunity for cities, States or regional units to initiate, explore, and test new collection and disposal techniques. It offers heavy Federal support and places strong emphasis on a Federal-State-local partnership to protect and enhance the quality of the environment.

In addition to support for construction, the proposed legislation would augment the Federal share of planning costs in the field of solid wastes. The present law provides up to 50 percent of the costs of surveys of solid waste disposal practices. The proposed law raises the participation to two-thirds of the cost for individual municipalities and 75 percent for regional organizations.

Four days of hearings are scheduled for late September, 1969 with further hearings to take place in the field. Many of you, I hope, will be able to attend to give us the benefit of your invaluable guidance and knowledge.

Senator Edmund S. Muskie of Maine, when the new bill was introduced last April, made an important observation on the Senate floor: "I do not believe that America can continue indefinitely to burn, bury, or throw away the solid wastes generated by its people. There simply are not enough resources, enough land area, or enough clear air and clear water to permit the mere refinement of existing approaches to solid waste management."

Too little thought, I believe, has centered on just such environmental issues, the finite supply of materials available in and

on earth. The world supply of nickel, I understand, will be depleted before the end of this century if the current usage rate continues. Obviously, more and more nickel-users will have to turn to alternative metals. Perhaps our five-cent coin may be known someday as a "steel." Who today is considering what effect the lack of nickel would have? What other materials are in this category?

I am convinced a role exists for the Federal Government in establishing a coordinated materials policy; not to dictate usage of materials, but to provide inventories of world supplies of materials, assistance in research into alternatives for those materials in short supply or damaging to the environment, and promotion of economic methods for recycling discarded products back into the economy.

We may invent bottles that dissolve when broken, or cans that degrade. We may be able to devise methods for quick and profitable disposal of cars, instead of piling old autos on dumps to rust away.

The discovery of more efficient ways to produce materials that do not persist in the environment following use, might go far toward reducing the $3.4 billion we spend each year for garbage collection and disposal in our urban areas.

We must begin to look at the trash heaps of our Nation as mines, potentially as valuable as the Comstock Lode. A typical ton of municipal waste contains a third of the heat potential of a ton of coal. This is just one example of a currently wasted resource.

The materials problem must be faced from two directions—from its source, and after it has completed its useful life.

During this session of Congress, I hope to introduce an amendment to the pending Resource Recovery Act (S.2005) to create a Presidential Commission on Materials Policy. The Commission would have broad authority to pursue questions of coordination of materials policy toward a goal of environmental enhancement, reporting to the Congress its suggestions for action.

This proposed amendment is the outgrowth of two very knowledgeable reports on materials policy, a survey published by the Senate Committee on Public Works in January 1968, and a second, more detailed report recently released by the same com-

mittee. The latter, called *Toward a National Materials Policy*, was prepared by some of the Nation's most prominent experts in the materials field. After an intensive examination of the subject, these experts conclude:

> We should insure an adequate supply of all types of materials needed in appropriate balance for our production requirements, both in peace and during national emergencies; we should husband our resources by efficient processing techniques and by the use of commonly available materials as alternates for materials that may become short in supply.
>
> Future concerns will involve the ability of the materials and energy resource base to support national and world aspirations for economic growth, and the implications for the economy of periodic changes in the relative prices of various materials.
>
> We need to develop new materials with novel properties to satisfy the more stringent demands of advanced technologies.
>
> Finally, it is of the utmost importance that, from the initial states of production of materials through their ultimate use and disposal, we conduct our operations and activities in such a way as to minimize pollution of air and water and to avoid despoliation of the environment, both physical and biological.

Solid wastes were a public problem long before the advent of our industrialized society. On the coast of Maine, there is a huge pile of clam shells left beside the Damariscotta River by a tribe of Indians long ago. Like us, they had no method of disposing of their no-longer-needed shells, so they threw them on a giant heap. Today it is a tourist attraction. However, not all wastes are picturesque.

We may find it difficult to charge admission to view abandoned freight cars and refrigerators. George Dutcher, director of the Public Works Department of New Castle County, Delaware, includes a page of cartoons in a recent report. One cartoon is headed *Collecting refuse will one day carry great prestige and affluence*. The drawing shows a dejected son telling his father that

he has flunked the Department of Sanitation test. Father answers: "You know what that means, son, Medical School."

The fact is that we are dealing with man's health and his survival as a civilized being when we tackle the problem of solid wastes. Man surrounded by piles of garbage is little removed from man surrounded by an epidemic of plague. Proper health measures defeated plague. I feel confident that planning and proper measures can master our solid waste problems as well.

THE PLANNING PROCESS

*Thomas H. Roberts**

One thing I do not propose to do is to offer a once-and-for-all, sure-fire, air-tight definition of *planning* or—perish the thought—of *comprehensive planning*. If the planning profession hasn't been able to do this after 52 years of concentrated effort, I certainly will not try to do it in a few minutes.

Instead, I will resort to a very old definition that I learned in my first year in planning school and one that still fits pretty well today: "planning is an aid to the decision-making process." Note the three key words: *aid, decision-making*, and *process*.

Let's start with *aid*. Neither professional planners nor the general public should fool themselves into thinking that the planners are the decision-makers. In our society, elected officials are usually the decision-makers. A planner's recommendation is not a decision until it has been carried out by someone in authority to do so. Without follow-through a plan is worse than useless. Decisions can be made with or without planning; it happens every day. So the plan is—or should be—only the beginning, and the planner should try to build into his plans as much likelihood as possible that they can and will be carried out.

The second key word is *decision-making*. It really doesn't matter how exciting or innovative or clever a plan is if it is not aimed toward the influencing of decisions.

The third key word is *process*. We live in a changing world. People change, problems change, technology changes, and social purposes change. Any plan or program which is static and insensitive to changing times becomes obsolete very quickly.

Seven Planning Trends and What They Mean

Let me summarize seven emerging trends which characterize the contemporary planning scene and suggest some ways in which they can influence the relationship between solid waste management planning and the overall comprehensive planning process.

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* Executive Director, American Institute of Planners.

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First of all, planning has "arrived." Two or three decades ago planning was considered at best to be naive and at worst to be downright communistic. Today it is downright mandatory, whether you are a local government trying to get a Federal grant or a retail chain store owner trying to capture your share of the clothing market. This sudden popularity has had many good effects and at least two bad effects. For one thing, there aren't enough good planners to go around. And for another, planning has sometimes been oversold. People are led to believe that problems will get solved if only they will appropriate more money to make more plans. Under this theory, the planner is a professional hand-wringer: if you can't solve a problem at least you can hire someone to worry about it for you. And if *he* can't solve it, at least he can gather more data to describe it to you.

We can be thankful, of course, that planning is more popular than it used to be. We must be careful, however, not to abuse this popularity by allowing our plans to be intellectual but irrelevant exercises.

Second, comprehensive planning now deals increasingly with interrelationships between subject areas and less with the internal details of a given subject. This has become necessary because of the sheer volume and diversity of subject areas to be dealt with. Planners have found themselves confronted with the classic choice: either learning more and more about less and less until they know everything about nothing, or learning less and less about more and more until they know nothing about everything. It is literally impossible for an urban or regional planner to possess expertise in all of the fields with which he must deal—law, transportation, government, housing, site design, and so on. However, he is expected to have a facility for coordinating and interrelating these fields with one another and for developing policies, plans, and programs that cut across them.

This is best illustrated by the nature of the oral examination which an applicant must pass before being admitted to full membership in the American Institute of Planners. First, he is asked to discuss and compare various approaches to the total comprehensive planning process, including land use and physical environment, transportation systems, human resources, economic functions, community facilities, and government and finance. Second, he may select any *one* of twelve areas of concentration

and relate it to the comprehensive planning process. These twelve areas are: administration for planning and development; comprehensive physical planning; resource development; social planning; transportation planning; urban design; research methodology and theory; economic planning; environmental sciences planning; renewal planning; planning law; and programming and budgeting. A perspective planner may be an excellent transportation systems technologist, but if he claims to be a comprehensive planner as well, he must have a reasonably good awareness of many other factors, such as government, public finance, and human resources, so that he can take into account their complicated web of physical, social, economic, and political interrelationships. In short, the special contribution that the planner is supposed to bring to the planning process is not simply a knowledge of one more subject area, but an ability to build bridges between them.

It is tempting to become impatient with this ever-widening circle of interrelationships and to want to cut back, to draw a line, and to say, "I'll do *my* planning in *my* backyard, and I don't want to be slowed down by worrying about some endless network of interrelationships." But it is this very compartmentalized approach to decision-making that has gotten us into a lot of the messes we are in today. An example from the field we are now concerned with—solid waste management—is appropriate. We know that solid waste can be transformed into gaseous waste by burning it; it can be transformed into liquid waste by grinding it; or it can remain as a solid material and be transported to landfills. We certainly do not want to solve a solid waste problem by creating an air pollution problem, a water pollution problem, a transportation problem, or a land use environmental problem. So nowadays, like it or not, we can't do a conscientious job in our own field unless we worry about the effects that our problem and solutions will have on the next fellow's problem and solutions. It is the comprehensive planner's job to help us do this—to help us develop integrated policies, plans and programs, even though they may be separately administered.

Third, planning has moved closer to government and has become more and more and more a part of the public decision-making process which it is supposed to be advising. Not too long ago most planning was conducted by advisory boards composed of appointed citizens. This was done intentionally. Both citizens

and elected officials felt that plans would have more integrity if they were kept out of the political decision-making process. The only trouble was that this integrity was purchased at the price of irrelevance. We all know what happened to the volumes and volumes of planning studies and reports that were produced under this virginal concept. The sheer bulk of unused plans has probably contributed more to our solid waste disposal problem than any other single source!

Let's look at one way in which planning and politics have to work together. In a typical metropolitan area it often turns out that the solid waste disposal problem is concentrated in one jurisdiction—the central city, for example—but the means for its solution is available somewhere else, possibly in a sprawling outlying county with lots of open space for sanitary landfill sites. Local governments, like people, are motivated by self-interest. (A rural philosopher once pointed out to me that pigs didn't huddle together to keep each other warm, they huddle together to keep themselves warm.) Therefore, the outlying county isn't going to fall all over itself trying to help the central city with its solid waste problem, even though it is the commuters from the outlying county who contribute to the problem. But maybe the outlying county has a problem on which it needs help from the central city, freeway access to downtown, for example. At this point, political bargaining can be quite effective. Reciprocal backscratching is a time-honored custom, and the planner must not overlook its potential in the art of planning.

Fourth, what was largely city planning a few years ago now occurs at all levels of government—city, county, state, and national. This symposium of state, local, and regional officials is characteristic of the change. Planning at all levels of government will allow us, if we will let it, to achieve better integration of our policies, plans, programs, and expenditures.

Fifth, planning has become horizontally intergovernmental. Planning efforts now span over several cities and counties at a crack, in the form of metropolitan planning agencies and regional councils of local governments. This kind of planning has obvious limitations as long as the implementation powers rest with the several individual local governments, but at least it is a start. It lets us define problems and solutions on a metropolitan area-wide basis, and it lets us look for ways to create regional implementa-

tion programs, or at least coordinate and standardize local implementation programs. It also provides to higher levels of government, such as the State, a handle to work with in enforcing or coordinating metropolitan area-wide standards or efforts. A metropolitan council of elected officials, for example, is a useful place to strike the kind of political bargain I mentioned above.

Sixth, the planning process has gone modern and has adopted and adapted data processing and systems analysis techniques from other fields. In turn, many of the analytical and planning tools now available within other parts of the planning process, particularly urban transportation and land use models, are available for application to solid waste systems planning.

Finally, planning and planners are a "mixed bag." The planning field is marked more by diversity than by homogeneity. Some planners are very practical and some are very theoretical. Some work within government, some work close to government, and some work outside of government. Some work at the city block and neighborhood level, some at the county level, some at the regional level, and some at state and national levels. Some are physically-oriented, some socially-oriented, and some economically-oriented. And I suspect that the solid waste planning and management problem in all of its many facets cuts right across and weaves in and out of all of these aspects of the planning profession and the planning process.

How Comprehensive Planning Can Help Solid Waste Planning

Established planning firms and planning agencies at all levels of government can assist the preparation and implementation of solid waste management plans in at least three ways:

First, they can be a *source of organized information* and intelligence about the present and future of the area under study –its population forecast and geographic distribution; its land use, transportation, and public facility plans; and its social and economic problems and characteristics.

Second, they can help to *relate solid waste planning to other functional planning areas*. For example, they can help provide an inventory of potential landfill sites that offer minimum conflicts with conservation objectives and other competing land use proposals. They can also recommend optimum routes for hauling, based on present and future traffic volumes, capacities, and plans.

Third, they can help *tie solid waste and other plans into the decision-making processes* of the governments which they serve.

Five "Don'ts"

Solid waste management planning is now coming into its own, and the volume and level of planning efforts in this field are certain to keep increasing. A few signposts can help in avoiding mistakes that have been made in other functional planning areas. Here is a list of five "don'ts" which have been gleaned from comparable planning experience in other fields.

First, don't direct your planning efforts simply toward treatment and disposal. Concern yourselves with the source of the problem as well—that is, with the policies governing the generation of solid wastes.

For years, we tried to plan urban highways in response to expressed or projected vehicular demands, and in many places it has been a losing battle. We just could not catch up. If anything, our efforts seem to have induced more demand. For years, household detergents played havoc with water quality control efforts until people became concerned enough to stimulate research efforts aimed toward a change in the product.

Similarly, solid waste policies should be concerned about the costs imposed on society by the proliferation of such things as nonreturnable bottles and nondegradable containers. Unless you look for ways to control solid waste at the source—through effective incentives and restrictions—you just may never catch up!

Second, don't get "data-happy." I am sure that there are not enough data available on which to base perfect solid waste plans. I am equally sure that there never will be. We planners have been guilty of gathering, manipulating, and massaging data, because we were interested, or because data were there, or because we had a large computer capacity to fill. Clearly, data and data processing are necessary and useful. But at some point we should move on to planning and implementation, even though more data could be gathered and even though we feel somewhat uncomfortable and a little unready.

Third, don't develop a "modal loyalty." In transportation planning we have people who swear by freeways but hate rapid

transit, and vice versa. In housing planning, we have people who feel that single-family houses are an unmitigated evil and that apartments are the salvation of mankind, and vice versa. I suspect that these loyalties often have Freudian origins and have little to do with an objective look at the problem and the proper mix of solutions. These debates are often fueled by the industries and producers who profit by given modes, and the planner should not succumb.

Fourth, as I suggested earlier, *don't solve the problem assigned to you by creating a problem for someone else.* Try to be comprehensive and look at the broad range of implications for land use, for transportation, for conservation and ecological consideration, for the neighboring jurisdictions, and for the impact of your plans on the poor and disadvantaged.

Fifth, and last, *don't re-invent the wheel.* Many of the techniques and studies developed by others can be retailored to your needs, and this can be cheaper, faster, and just as effective as starting from scratch with a brand new research grant to discover the Garden of Eden.

If a competent planning agency has developed a reasonably good population and economic base forecast, examine it objectively and use it for your own purposes. If a transportation planner has developed a technique for correlating land use and density categories with trip generation factors, tinker with it a little and see if it won't produce solid waste generation levels as well.

Although the subject matter and "tricks of the trade" for solid waste planning are different from those of other planning fields, the basic planning process is probably fairly similar in many respects, including phases of inventory, projection of generation factors, selection of geographical distributions, analysis and selection of generation conditions such as changing technology and consumer preferences, and analysis and choice of management conditions.

If we don't seek and exploit these parallels, we will be the ones to suffer because we will put off solving a solvable problem. As that famous philosopher, Pogo, once said, "We have met the enemy, and they are us."

WORKSHOPS ON PLANNING FOR SOLID WASTE MANAGEMENT

In eight concurrent workshops the representatives of 47 States and eight regions discussed guidelines for planning in solid waste management. The workshops varied in their approach, some concentrating on planning procedures, others on planning problems, and still others on problems in implementing plans. In general, the workshop discussions reflected the state of development of the solid waste management program in the State or region.

What is a Plan?

"Planning is an aid to the decision-making process." This definition, offered by Thomas H. Roberts in the plenary session, stimulated discussion on the part of workshop participants. They agreed that a plan for solid waste management should be a guide for intended action, showing times and priorities, developed with a view toward implementation, not as a showpiece or status report.

Although the workshops were not in complete agreement on what should and what should not be included in a plan for solid waste management, they concluded that the plan should generally include: (1) a statement of the problem, including an analysis of any data available; (2) the establishment of objectives; (3) an outline of the methods by which the objectives would be achieved; (4) a time schedule for achievement of the objectives; (5) an indication of the scope of legislation required; and (6) some definition of jurisdictions and responsibilities.

Some workshop participants felt that a plan should be more inclusive and should provide for some or all of the following: (1) specific legislative recommendations; (2) an outline of regulations; (3) requirements for inspection, licensing, and enforcement; (4) consideration on recruitment and training of personnel; (5) recommendations on technical assistance; (6) information on financing and cost-effectiveness; and (7) provision for public relations and public information. To the majority of the workshop participants, the plan is a guidebook. However, there are others to whom it is a road map containing specific route indications.

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All the workshops discussed the publication on State planning distributed by the Bureau of Solid Waste Management of the Environmental Health Service. Most of the discussants regarded the guidelines as a useful general pattern, with existing legislation and community practice affecting the conformity of any one State's plan with the guidelines. Although some State representatives believe that any plan should be sufficiently detailed to cover procedures at each jurisdictional level, the majority favor policy orientation in the State plan, with specifics to be spelled out in regulations proceeding from the policy statements.

Objectives and Priorities

A plan for solid waste management has as its objectives: (1) orderly management of solid waste disposal; (2) appropriate legislation; (3) effective public understanding; and (4) technical improvement. Priorities vary from State to State, depending on previous experience and legislation, level of urbanization and industrialization, extent of public information, and previous financial support. In one State, licensing is an important objective; in another, legislation is the major goal; in still others, better control, increased funding, better management, greater coordination may be the most important considerations.

Planning for specific time schedules (goals to be accomplished in one, two, five or ten years) depends on the State needs and the forecasts of future developments. Such details as location and size of disposal facilities, control mechanisms and personnel requirements should be left to administrative decision.

Problems

Problems in planning merged in discussion with problems of execution. All eight workshops reported essentially the same basic problems: (1) The social problem—interpretation and understanding by the public of the nature of the solid waste situation and the need for solutions, particularly for those solutions recommended by the planning authority; (2) the budgetary problem—the need for funds to support the establishment of appropriate facilities; (3) the political problem—local vs. State control, legisla-

tion vs. regulation, and local jurisdiction vs. area needs; (4) setting priorities involving immediate as against long-range goals, industrial as against agricultural considerations, eyesores as against economics; (5) technological problems--the need to do something vs. lack of appropriate technology or lack of data on which to base decisions.

Public Understanding. One workshop group stated that 90% of a good plan for solid waste management consisted of public relations. Other workshops cited no special percentage figures, but agreed that lack of public awareness, lack of planning for public education, and lack of personnel for public information seriously handicapped the adoption and acceptance of any solid waste plan. "People do not recognize the problem until it is beyond immediate control." .... "People are concerned with solid waste collection, but not with solid waste disposal." .... "People do not understand the nature of the solutions proposed nor the relationship of these solutions to their own cities and States." These were typical comments.

Funds. A problem common to every jurisdiction is the fact that good plans are expensive in land, personnel, and equipment. Legislatures which recommend plans and programs, but delay in appropriating funds, may overwhelm local agencies charged with application and enforcement.

Political factors impeding the operation of a plan were mentioned by every participant. Only very recently have States recognized that coordinated action and uniform policy control are necessary for the implementation of statewide plans. The mere existance of the plan cannot make the problem go away.

In a single State there may be a wide range in the size and population of individual counties; there may be wide variation in local needs and local conditions; there may be disagreement among courts in different jurisdictions; there may be considerable variation in local ordinances and local regulations; there may be variation in the methods of reporting solid waste data; there may be no established procedure for coordinating different agencies. These situations present obvious difficulties in the way of arriving at and implementing a plan for solid waste management.

A State law may approve a disposal site, but a local ordinance may close it. The State may formulate a plan, but may not have authority to require compliance Several agencies within a single

jurisdiction may have overlapping responsibilities: for example, health authorities, water and/or air pollution authorities, police forces, public works departments, conservation and natural resources departments, agriculture and commerce departments.

The consensus of the workshops was that the State plan should recognize variation in local conditions, that it should establish the basic acceptable standards below which no locality should fall, and leave flexibility beyond the minimum to each locality. Experiences with the reverse pattern, i.e., situations involving separate plans developed by counties and cities, later incorporated into statewide plans, presented greater difficulties.

Many kinds of jurisdictional problems were discussed. Solid waste management is not usually a completely local problem, and cannot usually be handled on a completely local basis. Cities and their adjacent counties, industrial areas and their rural environs, wastes generated in one area and disposed of in another—such problems are common to all State planners. There was general agreement that the solution to such difficulties required that the plan be supported through appropriate legislation and coordinated action.

Priorities and Technology. The problem of priorities is related to the political problems cited above, since the pressures of county and municipal governments and the pressures of local industry affect time schedules and priorities of implementation. Technology—or the lack thereof—was cited as a planning problem by only one State.

Specific Situations

Sites. Almost every planner and administrator mentioned site location as a major planning problem. Any site proposed produces local opposition. The only answer thus far devised has been the use of an adequate public information program. Many States have not considered the land use of completed disposal sites, while others have not properly prepared the way for the announcement of new disposal locations.

Rural Situations. Small rural areas have no planning staffs and need help. Rural collection and transportation must also be considered in State planning.

Special Disposal Problems. Planners face many kinds of special situations, demanding particular types of skill for solution. Industrial wastes are sometimes privately handled, sometimes not. Present disposal methods for agricultural wastes and anti-burning laws frequently conflict.

Disasters. In areas where natural catastrophes may occur, special provision must be made for situations of flood, earthquake, hurricane, or tornado. More recently, it has become important to plan for manmade disasters, such as strikes.

The Seas. Ocean disposal, for example, may and probably will create interstate disputes. Oil tankers discharging wastes at sea bring about both interstate and international disputes. If disposal at sea is beyond State boundaries and jurisdiction, may it be included in the State plan? No answer seems to be available to this question at present.

Personnel. For many State planners, the major problem reported was in the field of recruitment and training of personnel.

Guidelines for State Planning

Tentative guidelines for a State plan for solid waste management were distributed by the Bureau of Solid Waste Management to all participants. Comments on the guidelines centered on the role of the State in relation to local and area management programs. In all workshops, the majority felt that the State should establish minimum requirements or standards to be met by all local and regional governments. The latter, in turn, can implement or expand the requirements. The planning process cannot realistically predict all the actual situations in every region, nor can plans be the same for all States. Geographic, social, political, industrial and technical resources vary from State to State and from region to region.

In most States the planning process is already well advanced and in some it has been completed. Most States reported legislation enacted and implementation beginning. In those States which received the guidelines prior to the completion of planning, the document proved helpful. There was agreement among the workshops that the guidelines were better used as a general guide than as a specific pattern.

Conclusions

Three roles were seen for a State plan in solid waste management: (1) setting minimum standards for local agencies; (2) providing a general legislative support document; (3) providing technical and policy guidelines.

The workshops produced a lengthy list of needs and a short list of recommendations. Needs include: research in planning and solid waste management; legislation to permit and encourage cooperation among agencies and among jurisdictions; improved public relations; larger budgets; and updating of survey data.

Recommendations included: development of help from government and industry in planning for the special situations outlined above (oil spillage, agricultural wastes, sea disposal); inclusion of county and municipal governments in the State planning process; improvement in data on seasonal and geographic variations.

Several officials asked to be informed about grants and activities in their States, not only those in the field of solid waste management, but also in related areas. They would also like to be better informed about new developments in packaging and processing, so that these developments could be incorporated in their planning.

By whatever standard, the most helpful tool in solid waste planning has been a sound public relations program. Some States have set up community advisory committees representing the public. Others have set up coordinating committees among State agencies (health, parks, roads, pollution control, etc.). From both types of committees, news releases, public speakers and radio and television programs have gone out to the general public. These information activities have been particularly helpful in securing acceptance of sites for landfills. (Only one area reported no problem in site selection; that one uses Federal land.) One State has awarded a contract to a public relations firm to study the psychology of opposition to landfill sites.

Local objections to landfill sites have been counteracted in some States by grants. One State requires communities with a population density of 300 per square mile to provide solid waste management plans. This has stimulated areawide planning since the State provides half the funding. Such techniques have proved

helpful to the planning process, as well as important in implementation.

The workshop participants were agreed that information from the Bureau of Solid Waste Management on research results, condensed guidelines, exchange of information, and grants from all Federal Agencies related to environmental problems, would be of assistance to both planners and operators of solid waste management programs.

DATA FOR SOLID WASTE PLANNING: WHAT IS PAST IS PROLOGUE

*Leo Weaver**

NEVER UNDERESTIMATE the importance of previous experience. "What is past is prologue" is inscribed at the entrance of the National Archives Building in Washington, D.C. A Washington taxi driver is said to have "translated" this to mean "You ain't seen nothin' yet." This phrase aptly describes the present status of data collection programs in the solid waste management field.

Recently Finley G. Martin wrote in *Engineer* that man's total body of knowledge doubled between 1775 and 1900.[1] It doubled again between 1900 and 1950 and again between 1950 and 1958, and now it is thought to be doubling every five years. Fantastic? Yes, but because we started with so little, even this phenomenal rate of knowledge expansion will fail to meet the need for solid waste management systems. I believe we have more than doubled our knowledge of solid waste management in the three years since our meeting in 1966.

Data collection serves a number of worthwhile purposes—and some not so worthwhile. For a long time the guiding principle was for each government to seek more-or-less random bits of information from sister cities or other governmental jurisdictions. The theory was that if more cities follow Plan I than follow Plan II, Plan I must be the better plan. The method of obtaining information was usually a mail query. Typically, questionnaires were mailed to representative cities by convenient population groupings to determine what solid waste was collected; how it was separated; what department was responsible; the number in a typical collection crew; what was the average wage; whether a task system was used; what regulations were enforced; when and where collections were made; and so on. Common questions were on the cost of collection and disposal for each unit of time and the weight and volume of collected material.

Recommended definitions of refuse, garbage, and rubbish, and other forms of solid wastes were contained in the first issue of the

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manual *Refuse Collection Practice* published in 1941 by the American Public Works Association.[2] However, local custom and definitions imbedded in the legal concrete of local ordinances and regulations persisted, and one community's "garbage" might be the same as another community's "mixed refuse," with great variations possible from city to city, even those using the same terminology. Only the broadest kind of comparison could be made and then only with great care. Realistic comparisons could be made with difficulty even in the simplest areas; for example, are municipal employees used to collect refuse from households: yes or no? Cost and quantity data of all types were particularly suspect.

During the late 1950's, the APWA's committee on disposal prepared the text of the first edition of *Municipal Refuse Disposal*.[3] The committee decided that the mail questionnaire would not be used. In its place was substituted the personal interview by a technically competent individual obtaining data through visits to selected cities. The secretary of the committee, under a grant from the U.S. Public Health Service, obtained information in this way from 12 cities. He was successful in terms of common definition of such items as food wastes and rubbish. But this, of course, did not eliminate estimates and judgments; it only gave some assurance of realistic estimates and judgments. It did not really seem necessary at that time to measure the intensity of the odor or the blackness of the smoke from an open burning dump. We had not yet attained the level of "how clean is clean" or "how dirty is dirty."

We have much data on community collection systems or the lack thereof, on burning dumps, incinerators, or landfills without burning, but we lack almost completely an evaluation of subsystems and therefore of the total system.

One cannot evaluate without some form of guidelines or criteria. Early in our consideration must come a goal, after which we can decide what kind of data we need and the techniques appropriate in obtaining them. If data are collected to make possible planning, systems evaluation, and implementation of better and more economical systems to meet people's needs, then data collection is definitely worthwhile.

The key words in this statement—*planning, systems evaluation,* and *implementation*—indicate the goals and provide clues to the kinds of data needed to achieve the goals.

We frequently refer to the Solid Waste Disposal Act of 1965 as the beginning of a new era in the field of solid waste management. Certainly this Act is the point of departure for data collection, since it made possible a survey of community solid waste practices. This survey represents the first comprehensive effort to obtain data with sufficient coverage and accuracy to permit evaluation of solid waste management practices on a national basis. We waited a long time. The first effort toward a national inventory of water and sewage facilities emanated from the Stream Survey Center in Cincinnati more than half a century ago.

While we already had sufficient piecemeal data to suspect rather strongly that there were critical lacks in the thousands of collection and disposal non-systems across the country, we could not quote definite numbers with any degree of certainty. A primary goal of the survey design was therefore to determine the state of the art. Because of the experience of previous committees, we knew this could not be done acceptably by mailed questionnaires. Our conclusion was that an individual survey interview in each area would be required. However, considering the limited resources available for the planning at the time, our efforts had to be geared toward that portion of the problem which affected most communities most severely: household services and certain commercial services.

We decided that agricultural, industrial and Federal agency sources would not be included comprehensively in that phase of the planning survey insofar as the Federal guidelines were concerned. Experience in the water pollution program was helpful in this evaluation. We knew, for example, that 50,000 Federal installations had been catalogued for sewage disposal purposes in the Federal agency water pollution control survey. These decisions should be reevaluated.

A few States have moved ahead in the field of agricultural and industrial waste management and can provide valuable experience for the assessment of industrial-agricultural-Federal agency solid waste management practice and data collection. In suggesting this reassessment, I am not recommending the expenditure of great amounts of time on the details of how best to get this type of data and what data bits are really important to obtain. I am referring to using data already available to set priorities on the direction of

planning or to diversify and intensify existing efforts in community-system-oriented data collection.

Two significant areas remain to be discussed: the first concerns data requirements for systems design; the second concerns obtaining the additional data required for action programs.

Data for Systems Design

One of the most important compromises made in the development of the data base suggested for the State surveys resulted from a realization that obtaining state-of-the-art information did not realistically lead to detailed system design input data. A survey could reasonably ascertain, for example, the population served and the types of trucks and manpower employed. Such a survey, however, could not feasibly develop in-depth evaluation of the system. Such evaluation would have required determination of the sizes of trucks, compaction efficiencies, routings, details of routes served, cataloguing personnel assigned to the various types of vehicles, and much other detailed data. It is probable that the surveyed agencies would not have this information readily available if they had such data at all.

Much has been written about the development of mathematical models, and work has been carried out in this field at Johns Hopkins, Northwestern, and North Carolina State Universities. The fact is, however, that even if successful models are developed, they cannot be applied without the benefit of locally oriented "k" factor input. In my opinion, it is time to begin to move ahead on the development of locally oriented systems design data input. I feel that such an effort is a legitimate part of the State planning process, and that the most feasible mechanism is the case-study approach.

Our workshop sessions could profitably consider the implication of assigning certain planning resources available to the development of systems design data on a case study basis. If this proves appropriate, I believe that the Bureau of Solid Waste Management should initiate a program to develop suggested guidelines for use in such case studies to facilitate interjurisdictional application of mathematical models developed for various subsystems in the total community solid waste management system.

Additional Data for Action Programs

It is clearly not our purpose to become perpetual data collectors or perpetual planners, but to develop additional data in order to develop action programs. Data collection is not an end in itself.

An illustration may clarify this point. There is an oft-quoted figure—94 percent—of the number of land disposal sites which fail to meet sanitary landfill criteria, based on the built-in checks and balances within the survey form itself.[4] This is not appreciably greater than the subjective evaluation made by the survey reporters. Some 85 percent of landfills were rated as below satisfactory levels in the land disposal site investigation report.

Let's accept the fact that most landfills are poor. What are the reasons? What do we need to do to correct the situation? Is the problem lack of money? Bad management? Lack of training? Lack of skilled people? Low salaries? Lack of appreciation? Or is it a mixture of all or some of these factors? These are the data we must have if we are to correct the situation. Such data are the basis for planning and implementation of a remedial program.

The Advisory Commission on Intergovernmental Relations, in its report *Urban and Rural America: Policies for Future Growth*, recommends the creation of a state land development agency empowered to undertake large-scale urban and new community land purchase, assembly, and improvement.[5] The commission feels that such a land development agency with appropriate powers for acquisition of land offers a promising means of implementing state and local urban growth policies. They present a draft legislation based in part on the 1968 act that established the New York State Urban Development Corporation. The draft act grants powers to acquire land by negotiation and the exercise of eminent domain, to arrange for site development, and to construct or contract for construction, of utilities, streets and other related improvements; also to hold land for later use, sell, lease or otherwise dispose of land or rights to private developers or public agencies, and finally to establish local or regional land development agencies. A regionally oriented statewide program under such legislation would make possible enormous advances in solid waste disposal.

Another example is derived from items 15 and 16 of the Public Health Service community description report used to survey solid

waste practices.[6] The classes of household refuse not collected are listed, and the frequency with which several types of refuse are collected is given. Are these policies established simply as a matter of local prerogative based on tradition, or have they evolved from a decision on a reasonable cost limit? Can we correlate frequency of collection with other information, such as the number of dumps in the county or the amount of roadside litter? Is it worthwhile to obtain the additional data required for such a comparison? A knowledgeable person could, based on his own experience, go through the information in the existing forms and suggest other areas where fruitful analyses might be made. Some of these might be:

- Cost versus service reportedly given, leading to cost of desirable level.
- Correlation between presence or absence of State regulations and local systems levels, or, said in another way, the need for State-level criteria from which local standards can be applied.
- The need for financial assistance at the local level (What is the community getting for its dollars spent, both municipal and private?).
- Are area-wide approaches doing a better job? Why?

The possibilities in existing data are legion. They challenge us not only to recognize the need, but also to establish priorities.

The data we now have are sufficient to set forth certain program guidelines for action. Several States have already done this. Our workshops today may be able to analyze data included in the community solid wastes practices report, to assess the adequacy of the information now available for action programs, and to determine what additional data are needed to guide the effort.

I consider that the most important function of the workshops is to set priorities so that whatever data we collect form a useful part of a projected action program.

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WORKSHOPS ON DATA FOR SOLID WASTE PLANNING

Information is vital for solid waste planning. Without data it is futile to attempt to forecast needs or set objectives. State solid waste planning agencies have surveyed the community solid waste practices in their States, with the three national forms developed by the Bureau of Solid Waste Management, and have used the data as a basis for their projections. They have added to these data by surveys in specific areas and by calling on other State agencies for necessary background information. All the workshop participants reported that their survey using the national forms had been of major assistance, although in certain significant areas (agricultural wastes, costs, etc.) the survey does not have sufficient coverage. They have also found that more detailed and precise figures are needed in regard to land use, population, physiography, and community practices. Physical factors reported should include topographic features, soil, groundwater, flood areas, oil and coal deposits, timber, and climate.

In some States the survey has been repeated in order to review and update findings. However, in most areas a total resurvey has been found impractical and various sampling methods have been used instead. Some data gatherers have covered individual regions intensively, while others have made complete surveys of specific types of waste. Resurveys are needed where great change has taken place in a short time, or where the legal picture has changed, or where special problems occur. Certain kinds of waste (agricultural, radiological, mining, etc.) have been the subject of such sampling surveys.

Methods for Resurveying

The workshops were generally in agreement that data should be updated on a continuing basis. Many channels are used for this purpose: checking licensed collectors, processors and disposers; using incinerator operational forms; requiring reports from disposal facilities; and utilizing data collected by other State agencies. Where possible, the information is fed into computers for tabulation. Sites

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should be surveyed at least once, and preferably twice, a year. In some States this is done via reports, while others have sanitarians visit and evaluate. Wherever resurveys have taken place, significant changes in the figures have been recorded. The survey appears to be an inaccurate survey.

Sources of Data

Using the information derived by other State agencies has been a fruitful source of information. The State department of commerce may list industries and provide information on industrial sites. Air and water pollution control agencies have relevant data. The health department has information on hospitals. Geology departments have information on ground surveys, water levels, and mines. Agriculture departments have information on agricultural wastes. The highway department has data on abandoned autos. The recreation department can report on campsites and parks.

Especially important as sources of information are the universities, both those within the State and those outside it. They can provide assistance in making surveys; they often have technical data in highly specific fields (animal feed lots, costs, economic uses, research); and they provide access to numerous types of disciplines.

Engineers employed by communities and regional governments, the U.S. Geological Survey, and State soil conservation bureaus, are often helpful to data collectors. Permits and applications in various areas can contain relevant information. Grants to localities for solid waste management programs can be accompanied by questionnaires.

One State has predicted its cost of solid waste disposal on the basis of retail sales and has found high correlation between these two statistics.

Special Surveys

Special problems vary from State to State and special surveys do likewise. Serious problems in one state may have merely nuisance value in another. Junked automobiles, for example, are of great importance to some, but relatively unimportant to others. A serious

problem requiring special consideration is the disposal of hazardous wastes, especially radioactive wastes. The workshops also mentioned hospital wastes, septic tank pumpings, catch-basin contents, and toxic chemicals as subjects of special surveys.

Industrial wastes were discussed at length, the feeling of the workshop participants being that surveys of such wastes were best dealt with by interview and investigation rather than by questionnaire. The survey should include both qualitative and quantitative data, composition of waste, flammability, solubility, and other significant characteristics. For industry, sampling must cover an entire locality or an entire type.

Surveys of junked cars indicate that this is a growing problem. Follow-up information is available from registration check and from highway departments, with junkyard control through permit. Fees paid for turning in junked autos have not proved successful, since they presented the junkyard operators with a bonanza and did not affect the individual owner. Dumping of autos in waters was generally discouraged. In one area, a portable crusher is used and has proved helpful.

A new form was proposed by Bureau staff for optional use in surveys of agricultural and industrial wastes. The workshops approved the approach and the objective, since lack of data in these fields has impeded prediction of needs and capacity. However, the workshops also felt that ambiguities in the questions should be resolved, as for example, differences between chemical, food, and liquid wastes; salvageable and salvaged wastes; wastes disposed of by more than one method; how to include commercial wastes. A broadside questionnaire approach to this survey was not favored by all the workshops; a sampling technique was suggested instead.

In every workshop, the need for as much data as possible and for the constant updating of surveys was emphasized.

INTERGOVERNMENTAL COOPERATION AND PUBLIC INVOLVEMENT IN SOLID WASTE MANAGEMENT

*Patrick Healy**

Intergovernmental cooperation and public involvement are crucial in solid waste management. The National Association of Counties has prepared a series of handsome booklets on solid waste management containing plenty of material on both intergovernmental cooperation and public involvement. The *Nation's Cities*, a monthly magazine published by the National League of Cities, devoted its September 1969 issue to the subject of pollution and included a fine article on solid waste reuse.

I have four basic thoughts to offer on the subject of discussion today:

1. Solid waste management, like everything else in our urban, industrial, technological country, is related to almost every other element in our society.

2. Federal, State, and regional capacities must be greatly improved to deal cooperatively with our growing mountains of trash.

3. Despite the activities of State and national agencies, the problem will remain essentially a local one, and local government will have to reorder itself, with all the help it can get, to cope with the problem.

4. The scientists and engineers who are busily and imaginatively designing new techniques for waste collection, disposal, and reuse will have to stay in close touch with local officials, who have the ultimate responsibility to see that the job gets done efficiently and economically.

The Interrelatedness of Everything

The City and County of Los Angeles, where the people produce about 750,000 tons of solid waste a month, provide a fine example

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of interrelationships. Since 1957, the law of Los Angeles has banned backyard burning of solid wastes. The sheriff flies helicopter patrols to catch people who may be dumping trash illegally near somebody else's backyard. Moreover, the combined City-County Health Departments have to employ 200 sanitarians to check on landfills and transfer stations. And, of course, the county engineer regulates some landfills. The Los Angeles Regional Water Quality Control Board has to pass on whether industrial waste disposal sites conform to specifications. The county treasurer, the tax collector and the health department are all involved in supervising private contractors who haul trash away from 59 cities in Los Angeles county. The business of solid waste management is the responsibility of at least five departments in both city and county governments.

Another example of the interrelatedness of everything comes from a much smaller area. The Bureau of Solid Waste Management gave a grant to the town of Barrington, Rhode Island to test the idea of having householders throw rubbish and garbage into kraft paper sacks which were then dumped at a model sanitary landfill. The homeowners were enthusiastic about using the kraft bags, which they found far easier to handle than conventional containers. Unfortunately, the dogs of Barrington also liked the bags; a hungry dog can chew through a bag much more easily than through a garbage can. So now Barrington has a leash law, which it did not have before.

Improving Capacity

Given the interrelationships inherent in the solid waste problem and its management, no single level of government can handle it effectively. Although this is a truism to people sophisticated in the field, as a nation we are just beginning to understand this proposition and to forge the necessary interjurisdictional links in the chain of waste management.

While the collection of waste will remain a local responsibility for the foreseeable future, disposal and/or reuse can no longer be accomplished solely by the city that generates the waste. Large cities do not have the disposal sites, and neither large cities nor small cities have all the other resources they need, especially the

money. (It costs San Francisco $31 a ton to handle solid waste these days.)

We need to move vigorously toward area-wide cooperation, and we need state help, too. The advantages of achieving area-wide cooperation are evident, but are worth repeating. Area operation brings about economies of scale; it permits greater flexibility in the choice of disposal sites; it enhances coordination of air and water pollution abatement; and it may serve to attract Federal financial assistance.

Here are some examples of regional cooperation in solid waste management fostered by councils of governments, as reported by the National Service to Regional Councils:

The Muscle Shoals Council of Local Governments in northern Alabama has developed a unique program for refuse disposal in its area. The Council, unable to raise funds to cover the costs for a regional study of solid waste disposal practices, recommended that the studies be carried out on a county level. As a result of the studies, two programs developed. In Florence a sanitary landfill was used. In the second case the county and three cities jointly purchased a tract of land, the major portion of which was used as an industrial park, with the remainder as sanitary landfill. When the fill area is complete it will be converted to a recreation park.

In the Richmond, Virginia area, the solid waste program may be placed under the authority of a park agency, although many legal and technical complications must be solved first. However, the solid waste program stands to gain two important advantages: (1) the power of eminent domain and (2) the power to issue bonds for revenue. The program would thus be assured of funds and would not have to depend entirely upon voluntary support.

The Association of Bay Area Governments recently completed a study of disposal practices in the San Francisco Bay area. In the report, disposal sites were analyzed, their capacities noted, public and private programs were broken down as were the costs of operation. The study laid the foundation for an action program in the Bay area.

The Statewide Comprehensive Transportation and Land Use Program of Rhode Island also recently completed a study of waste disposal. In its report the group recommended an action program, encompassing all aspects of planning, financing, constructing, and

managing refuse disposal facilities. The group recommended a State grant-in-aid fund of 40 cents per capita, to be apportioned to communities for refuse disposal, to encourage high quality service and joint use of refuse facilities.

In New York the Metropolitan Regional Council has been investigating the possibilities for intermunicipal solid waste management. The New York area is also studying the feasibility of better local monitoring of solid waste processing and establishing standardized regional waste measures.

In addition to such council actions in specific regions, State government will have to become more involved in solid waste disposal. For one thing, only State government can set the necessary standards and allocate the necessary resources to assure an orderly, sanitary, and economical solution to the problem. Only State government can take full account of population growth and movements, conservation, land-use planning, air and water pollution, and technological change.

Regrettably, State laws, like local waste management efforts, are too fragmented in their approach to assure coordinated results. Such waste management activities as storage, collection, transportation, processing, and disposal are treated as separate steps, rather than as part of an integrated process. As recently as 1962, only nine States (California, Connecticut, Kentucky, Michigan, New Jersey, Ohio, South Carolina, Tennessee, and Washington) had any provisions for formation of districts to operate area-wide disposal systems. We need State legislation to treat the sequential elements in the process as part of a whole system, rather than as unrelated tasks.

The Federal government, too, has a large stake in the outcome and must play a major role in assuring that we solve this problem. The efforts of the Bureau of Solid Waste Management have been a big step in the right direction, though there are many steps still to be taken. I particularly welcome Senator Muskie's proposed amendments to the Solid Waste Disposal Act, which would stimulate State and local area-wide waste management planning within a regional environmental protection system. The proposed bill would provide nearly three-quarters of a billion dollars to States and localities over the next five years to build solid waste disposal facilities and study

ways to recover and reuse salvageable materials that our society no longer can afford to burn, bury, or dump into the sea.

Finally, the Federal government should adopt tax and regulatory policies that will encourage—indeed, require—industry to develop modes of manufacturing and kinds of packaging that will minimize rather than maximize our solid waste management difficulties. State governments should do likewise.

Regional, State, and Federal governments must help local government in the management of waste disposal. The cities cannot cope with the whole problem, but for the foreseeable future they will be literally holding the bag—the trash bag. The cities bear the burden if the local trash pick-up system breaks down. They have to hire the trashmen or contract for rubbish removal service. They have to worry about where to put the junk when the landfill is full. They therefore have to look closely to see whether they are doing the job as best they can with the resources they have at hand—those resources are, I know, inadequate.

This brings me back to my first point—the interrelatedness of everything. I am not sure that our city governments are organizing themselves to do the job with full understanding of this principle. As W. C. Dutton (Chairman of the Maryland National Capital Planning Commission) suggested at a National League of Cities annual meeting a few years ago, perhaps our cities should reorganize their public works departments, sanitation departments, and some parts of their health and planning departments into a Department of Waste Management that would bring under one roof a coordinated approach to the land use, public health, and environmental protection problems associated with solid waste collection, processing, transfer, disposal, and recycling.

There certainly are many legal, administrative, political, and, most of all, financial constraints that will have to be relieved before our local, State, and Federal governments can undertake the tasks I have outlined, but I submit that as the public becomes more aware of the problem it will insist that these constraints be overcome. The National League of Cities stands ready to do its share to inform the public of the magnitude and the urgency of the problem we face.

One of the great needs is improvement of communications between the engineers and scientists who are working on the technology of waste management, and the public officials who have the ultimate responsibility for seeing the job through.

As we improve our technological capabilities, we shall, no doubt, find new ways to gather and get rid of our refuse. Perhaps we shall have pneumatic tubes, incinerators that do not pollute the air, maybe a "reverse cornucopia" that will consume a limitless amount of solid waste, even as our cornucopia-like factories produce an unending supply of consumer products packaged in bulky and indestructible containers.

One can envision revolutionary approaches to the collection and disposal problem. It may not be too far-fetched to expect that, some day, homes, apartment houses, public buildings, stores, and factories will have trash-burning systems that will provide them with usable heat and power without emitting air pollutants. I can foresee that trash collection might become a two-way system, carting away non-flammable wastes and delivering packaged flammables from other sources to feed the household heat-power generator. And perhaps that pick-up and delivery system could be used for other purposes too: to deliver mail, newspapers, and milk; to pick up school children, commuters, and shoppers, and, let us hope, deliver them home, too.

All this may be too fanciful, but it does suggest that there are surely going to be more ways than we can now imagine to deal with our waste problem. City governments are inevitably going to be directly and deeply affected by the new technology. Those who are concerned with local planning and those who are concerned with local governing must share in decisions as technological advances change our lives.

WORKSHOPS ON INTERGOVERNMENTAL COOPERATION AND PUBLIC INVOLVEMENT

Every State planning agency, without exception, recognizes that public relations and public information are vitally important factors in the success of any planning program for solid waste management. There is also an awareness of the difference between public relations and public information; every agency has public relations, good or bad, but effective public information can help to make public relations favorable rather than unfavorable.

The workshops which discussed public involvement also discussed intergovernmental cooperation, dealing with this matter in two different ways: (1) cooperation among various State agencies to achieve better solid waste management, avoid friction and secure relevant information; and (2) cooperation among governments of different jurisdictions, especially in areas where solid wastes generated in one area affect other areas. As in the case of public involvement, there was general agreement that good intergovernmental relations are desirable, but that such harmony was extremely difficult to establish.

Intergovernmental Cooperation

Cooperation among Federal Agencies. Programs affecting solid waste management are included in several Federal agencies and departments, including Housing and Urban Development, Transportation, Interior, Defense, as well as Health, Education and Welfare. The suggestion came from many State representatives that the Bureau of Solid Waste Management act as a coordinator of information from Federal sources, as well as a clearinghouse for information from private and research organizations. Information on policies and grants from all these sources would be conducive to better management.

Cooperation among State Agencies. Agencies within a State deal with health, roads, air pollution, water resources, geology, sanitary engineering, agriculture, commerce, forestry, recreation, and all of these have relationships to solid waste management. Federal grants for many different purposes, ranging from rat control to highways, may go to different State programs, without necessarily producing

cooperation among these programs. One agency may designate a disposal site; another may organize its operation; a third may enforce standards; a fourth may have the power to change location or methods of operation.

Examples of cooperation or the lack thereof were numerous: cooperation with the highway department in handling junked autos; with the forestry department on burning debris; with geologists to determine optimum landfill sites, safe depths, ground water levels; with recreation departments for use of completed landfills and for solution of problems of wastes at public campsites; with urban renewal and urban planning officials, with natural resources supervisors, with police and sheriff's offices. The list is long.

Since most agencies fear loss of traditional powers and independence, cooperation and coordination are not easy to achieve. Some States schedule regular meetings of department heads for mutual information, clearance of problems, and combination of resources. Other States use informal conferences and meetings, while still others have developed departments of environmental control in which various forms of pollution control are represented. In a few cases, the Office of State Planning acts as coordinating agency. In sum, although there is agreement on the need for cooperation, no uniformly successful technique has emerged.

Cooperation among Jurisdictions within States. Most States plan for solid waste management on a county basis. This has occasioned much difficulty in administration, especially for municipalities. There is a trend toward development of metropolitan planning agencies involving regional concepts. A formal council of governments has been set up in some areas, while in others meetings of county and city officials are scheduled under State guidance. Local legislation, local option and local practice vary in an almost infinite range of patterns of jurisdictional cooperation.

The supervision of the solid waste management program may be in the hands of health authorities, pollution control authorities, or natural resource officials. Planning may be in one set of hands, administration in another, licensing in another. Where State legislation has been enacted, authority may rest at the State level or at the county level. Cooperation between State and county officials has been improved by (1) systems of regular meetings; (2) State financial assistance to the counties; (3) State licensing and enforcement programs; and (5) setting of statewide standards.

The major stumbling block in coordination and intergovernmental cooperation has been the difficulty of getting counties and municipalities to work together. Site locations are usually the problem. Opposition on the part of those adjacent to proposed disposal sites is vocal and extreme, while support for the sites is usually lacking. Local problems, particularly those of the cities, cannot usually be solved within the municipality, and State involvement is almost inevitable.

Coordinating Groups. Cooperation among State agencies has been enhanced by formal meetings of pollution control officials with departments of geology, agriculture, highways, recreation, commerce, etc. Sometimes a solid waste interagency committee is established. In some areas, geography may require coordination on an interstate basis, and a few regional meetings have been held, usually with Federal assistance.

In the counties, coordinating groups have followed similar patterns, with the State providing assistance for inter-county or county-city coordination. An area council representing several counties and cities can, with State support, provide a more effective and more economical approach to solid waste management programs. An exchange of benefits (for example, roads for disposal sites) may prove mutually advantageous to the areas concerned.

The difficulties in the way of coordinated action range from constitutional limitations in some States, to financial difficulties in others, and include public understanding in all.

Public Involvement

Public education and public information on the subject of solid waste management are vital to the success of any program. There was unanimous agreement in every workshop that when people understand the problem and are involved in the planning, they tend to cooperate with the solutions devised and bring appropriate pressure to bear on elected and decision-making officials to carry plans into operation and provide funds for their implementation.

As suggestions for informing the public, the standard communications mechanisms were recommended: news releases; television programs; spot announcements on radio and TV; public meetings; posters; films. Speakers bureaus have been helpful,

especially in approaches to service and voter organizations. Public involvement has been handicapped by lack of appropriate materials, lack of budget, and sometimes by lack of relevance to local situations.

An effective public relations technique is to get a good operation started and publicize its effectiveness. Those in opposition to a program are usually active and vocal while those in support of it are passive and silent. Since budgets for public relations are meager in almost every jurisdiction, publications, films and posters from the Bureau of Solid Waste Management would be appreciated by States and cities.

There was little discussion of "forming" public opinion, and much discussion on "informing" the public. Increasing national awareness, TV coverage, and current interest in ecology have helped, but it is recognized that changes in public opinion come slowly. Basic changes come from local approaches to local problems rather than from general understanding of a global problem.

Advisory Committees

Most states have advisory committees of some type for their solid waste management programs. Some of these represent government agencies, while others are representative of the general public. The experience has been that public cooperation is more readily secured when local organizations such as the Chamber of Commerce, League of Women Voters, conservation groups, anti-pollution groups, etc., form a nucleus of public support for solid waste programs if they are included in advisory committees.

Another form of advisory committee centers on technical functions, ranging from planning to operational technology. Associations of cities, counties, professional groups, management groups, and industrial groups are all represented in one State or another. Public involvement is recognized as an important element in assuring the effectiveness of solid waste management plans. In spite of this, no pattern has emerged for either a public advisory interest or a public education program in this field.

SOLID WASTE LEGISLATION

Hugh Mields, Jr. *

State, territorial and interstate solid waste planning agencies represented at this Symposium have been intimately involved in collecting and analyzing data, in defining the nature and scope of solid waste problems and resources for their solution, and in the development of plans and specific proposals for solid waste management. However, these efforts may prove to be only an academic exercise unless this planning for program implementation is the product of an institutional arrangement that is capable of making political decisions to act affirmatively over the long run.

By an institutional arrangement able to make political decisions, I mean more than a cooperative effort on the part of all the governmental entities in the area—Federal, State, regional, and local. It will take no less than an unqualified political commitment on the part of all the relevant governmental bodies to pass the laws, raise and spend the money, and provide the authority necessary to actively implement the plans.

As bureaucrats and technicians, you will now be required to use all your imagination, talent, dedication, and muscle to convince the political policy-makers and your public constituency of the necessity for action—action now! The consequences of total inaction or partial effort will be magnification of the problems.

Only after all the governments having jurisdiction within a solid waste management region can agree upon the nature of their environmental problem and the fact that it has regional significance, can area-wide planning begin to move toward implementation and productive environmental management. In addition, these governments must agree on the quality of environment they want to provide and arrive at a general understanding on the means which will be required to achieve this condition. These considerations will intimately involve planners and managers in the political and legislative process.

We must be concerned with all the levels of government that affect our environmental mangement program from the activities of

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* Linton, Mields & Costen, Inc.

the Federal government and Congress to those of the State legislatures, the local councils and the county boards.

We must also be concerned with the environment as a whole. The interrelated nature of our environmental problems dictates a sweeping view of environmental legislation and action, including efforts at prevention, control, and abatement of pollution and plans for environmental management.

What is the status of our environment? What are the prospects for environmental legislation which will provide us with the necessary political solutions and institutional arrangements? Each day more statistical evidence is introduced to document the decaying state of our natural resources. Technical studies and reports indicate the vast complexity and integrated nature of the problems that must be faced in order to halt the continuing attacks upon the air, our water, our land, our health, and our welfare. In addition, environmental assaults are becoming page one topics in our newspapers and popular magazines, and the subject matter for nationwide television specials.

Increased public awareness and concern about the quality of the environment can be seen in the growing editorial treatment accorded the problems; in the flurry of activity among good government groups; in the rumblings emanating from corporate board rooms; and in the rising tone of political comment. Still, in spite of all this documentation, concern, publicity, and interest, the nation's environmental quality continues to deteriorate.

Some explanation for the contemporary state of the environment was offered by the recently released report of the American Chemical Society, *"Cleaning Our Environment."* This report, among other things, points an accusing finger at the failure to make use of pollution control technology already in existence; at the failure of Federal, State, and local governments to carry out legislative remedies already on the books; and at the failure to commit the money and energy needed to do the job.

More importantly, we have failed to achieve a national commitment for environmental quality. On a national level, we have not yet taken the crucial step necessary to build the institutional arrangement capable of making the political decisions necessary to restore our environment.

In his foreword to Edmund Faltermayer's book *Redoing America—A Nationwide Report on How to Make our Cities and*

Suburbs Livable, Charles Abrams makes the statement: "Public policy is now the most important force in determining whether our cities will improve or decline, whether our suburbs grow well or badly, whether our journeys to work will be comfortable or tedious, whether we breathe good air or bad, whether our slum neighborhoods will continue to seethe with tensions and violence. What is needed is a statement of national purpose . . ."

In spite of an increased awareness and a greater concern about the magnitude of environmental problems, we have yet to hear a statement of national purpose. We have yet to make a commitment for environmental quality, a national pledge which proclaims to all the various segments of our society: "Our air is going to be clean, our water clear, our land uncontaminated, and our health and our welfare free from environmental assault." Until our national purpose is made known and the commitment to quality proclaimed, our progress toward the solution to the complex, interrelated multitude of environmental problems will be fitful and sporadic.

Under our system of government, the offering of legislative programs and proposals at the national level is usually the function of the executive branch. For the last decade, however, in environmental legislation the Congress of the United States has taken the initiative. The Congress, more specifically the Committees on Public Works of both Houses, has recognized the national scope and character of environmental decay, and has introduced and actively prosecuted legislative responses to many of the most pressing environmental problems. In most cases the executive branch has followed, belatedly or reluctantly, behind the Congressional initiative.

State and local efforts to control environmental decay have been woefully inadequate in most cases. This has been due in large measure to the overwhelming magnitude of the problems. Despite the valiant efforts of the State of California and the Los Angeles Air Pollution Control District, the smog of Los Angeles is too much for their efforts alone. The failure of State and local governments to respond to environmental challenges has also been due in part to the pressure of private interest groups within their jurisdictions. The threat of an industry to take business, tax base, and payrolls elsewhere if forced to institute pollution controls is a strong whip over any State or municipal government.

The Congress, less bound by such pressures, has championed the idea of environmental quality and has laid the basis of what may become a national environmental policy. Senator Edmund S. Muskie of Maine has been a Congressional leader in the pursuit of a quality environment. As Chairman of the Senate Public Works Subcommittee on Air and Water Pollution, he has provided leadership, imagination and drive behind important legislative efforts.

In the past decade, the Congressional committees have produced vast amounts of informational and educational material, including hearings, testimony, and staff reports, which have played a part in bringing the nature and scope of environmental deterioration to the attention of press and public.

Congressional hearings have also brought into the public spotlight some of the shyer elements of our society. There has been some reluctance to take a public stand when the subject is the proper responsibility to halt environmental decay. Such reluctance has characterized vested business interests, State and local officials concerned about the possible loss of their powers, and passive Federal agencies opposed to taking an active role in fighting pollution and contamination, satisfied in restricting their role to research. While all of these groups have not become converts to the environmental causes of Congress, the Congressional hearing room has provided a good forum for public identification of arguments and points of difference, for the persuasive force of political compromise, and for the education of the recalcitrant.

And along with the documentation and rhetoric, the Congress has produced environmental legislation. In the last six years, major steps to confront specific attacks upon the environment have been taken with the Clean Air Act of 1963, and its 1965 and 1966 amendments; the Air Quality Act of 1967; the Water Quality Act of 1965; the Clean Water Restoration Act of 1966; and the Solid Waste Disposal Act of 1965. While these laws have not themselves enunciated a total national environmental policy and commitment, they have made probing steps in the required direction and have fixed into law several important environmental principles and working policies.

Among the principles which have been incorporated as basic features of Congressionally initiated environmental legislation is the idea that although environmental decay is a national problem, the

responsibility for providing environmental quality must be divided among all segments of society—public and private, the individual and the organization. The vast resources of the private sector are therefore encouraged to apply their technological expertise to the development of new, better and more economical solutions to specific environmental problems. State and local governments are given the responsibility to develop, administer, and enforce environmental standards as long as they are competent and responsive to the problem.

Perhaps of most importance is the recognition in this legislation of the need for comprehensive regional approaches to environmental problems. In most instances, particularly in metropolitan areas, local and State jurisdictional boundaries do not adequately describe the area which is relevant to the control of air or water pollution or the development of an effective program of solid waste management.

Almost all of us have been or now are going through the mill of the problems of multiple jurisdictions—overlapping, intertwining, oftentimes undermining. While our experience in trying to achieve city-county consolidations or other kinds of regional government has been just short of dismal, I am reasonably convinced that the regional approach is both necessary and ultimately possible. Councils of governments, which now number close to 100, give us good reason for hope. Almost all of these councils have been formed as a result of assistance provided by the Federal government under Section 701g of the Urban Planning Assistance Program enacted in 1965. Continued Federal aid and Federal pressure to require local governments to cooperate in taking a regional approach to common problems are absolutely essential to the process.

The most recent example of the determination of the Federal government to encourage a regional or area-wide approach in development programs which receive Federal aid is contained in Section 201 of Title IV of the Intergovernmental Cooperation Act of 1968. The Bureau of the Budget Circular A-95 initiates a formal regional and State review procedure for a wide range of Federal aid programs, including most of the Federal grants in the environmental field. This review procedure is intended to encourage appropriate local development programs receiving Federal money to reflect regional needs and priorities.

Grants of Federal money to local governments for construction of municipal waste treatment plants has been an important program addition to the environmental legislation emanating from Congress. The Public Works Committees recognized that there was a tremendous need for the construction and improvement of local municipal waste treatment plants if the quality of our streams and water was to be improved. The Committees also recognized the magnitude of the financial commitment necessary to get these plants built. As a result of the inclusion of this grant program, the water pollution program was given an initial boost as municipalities became financially able to initiate much-needed improvements in their waste treatment facilities. However, as the program has progressed, there has developed a gap between the Federal aid authorized in the water pollution legislation to meet the local needs and the amount actually appropriated. In the last several years, the gap between needs (authorization) and funding (appropriation) has widened.

In fiscal year 1969 the authorized amount for water pollution control was $700 million, but only $214 million was appropriated. In fiscal year 1970 the authorization is for $1 billion, but the Administration has again requested only $214 million for the program. The gap in these two years, therefore, is almost $1.3 billion. As a result, many critically needed water pollution control programs have been seriously delayed.

The impact which will be felt by pollution control programs if the Administration's requested funding is accepted, is indicated by the Executive Director of the Delaware Water and Air Resources Commission who recently stated that "... The appropriation of $214 million as opposed to the $1 billion authorized will drastically reduce the efforts of the state (Delaware) to meet the 1972 deadline imposed by the Water Quality Act of 1967 ..."

It appears, however, that a large number of Congressmen and Senators will attempt to push for full funding of $1 billion, or at least as much of this amount as can be used effectively this year, a sum estimated by the Interior Department as $600 million.

Even at a time of heavy anti-inflationary pressures, many members of Congress seem concerned about keeping the commitment to local government made in the Clean Water Restoration Act of 1966 and emphasized by the Water Quality Act. These legislative measures directed the States to impose water

quality standards, committed local governments to a timetable of compliance and included a program of construction grants. As of March 31, 1969, the Federal Water Pollution Control Agency listed a backlog of 4,525 waste treatment works projects, requiring an investment of over $5.1 billion.

Senator Muskie has continued his push for new environmental efforts by introducing the Resource Recovery Act. This legislation would take a giant step beyond the Solid Waste Disposal Act of 1965. The 1965 law provided for grants to the States to conduct surveys of municipal solid waste disposal practices and problems; to develop comprehensive State plans; and for demonstration projects to test new methods of disposing of solid wastes.

The Resource Recovery Act would take an innovative approach, placing heavy emphasis on the recovery, recycling, and reuse of the component materials in solid waste. The bill authorizes the Secretary to find recommended incentive programs (such as favorable tax treatment) to assist in solving the problems of solid waste disposal; and to investigate current production and packaging practices. Included in this portion of the bill would be demonstration projects to test the techniques developed in the study for recovering useful materials from solid wastes. Grants to State, interstate, municipal, and intermunicipal agencies to make surveys and plans, as well as a grant program for the construction of solid waste disposal facilities, are also recommended.

Great emphasis is placed in this prospective legislation upon regional planning and the reuse of resources, rather than simple disposal. Individual planning grants are to be coordinated with regional planning activities. The Federal share in construction grants would increase from 25 percent to 50 percent of the project if the area served includes more than one municipality. Additionally, if the construction project utilizes new techniques which will act to reduce the environmental impact of solid waste disposal, the Federal share would cover 75 percent of the reasonable costs of the project.

In June 1967, the Task Force on Environmental Health and Related Problems presented its report, *A Strategy for a Livable Environment* to the then Secretary of Health, Education, and Welfare, John Gardner. The Task Force recommended a grant-in-aid program for solid waste disposal at the local level by 1973 and envisioned research into new avenues for waste recycling. Both of

these recommendations are included in Senator Muskie's pending Resource Recovery Act.

In another portion of the same Linton Task Force Report in 1967, the Secretary of Health, Education, and Welfare was urged ". . . . as a major step toward meeting the challenge of environmental protection . . . to seek Congressional authorization to establish a council of Ecological Advisors to provide an overview, to assess activities in both the public and private sectors affecting environmental change, and to act in analyzing capacity; to be in a commanding position to advise on critical environmental risk-benefit decisions; and finally to be instrumental in the shaping of national policy on environmental management." I regard that last admonition—shaping a national policy—as most important.

President Nixon has created by Executive Order an Environmental Quality Council, composed of the Secretaries of Agriculture, Commerce, Health, Education, and Welfare, Housing and Urban Development, Interior, and Transportation. However, the House Appropriations Committee has denied this Council any operating funds, criticizing its "patchwork" approach. The Council has also been faulted because it must, essentially, make judgments on its own departmental programs.

The idea of a body of environmental advisors in the White House is, however, still alive. Senator Henry Jackson's bill to create a three-man Board of Environmental Quality Advisors, to be named by the President subject to Senate confirmation, passed the Senate in July 1969. Senator Muskie has incorporated into the omnibus water pollution bill, a proposal that would create an Office of Environmental Quality in the Executive Office of the President. This office would be headed by a Presidential appointee confirmed by the Senate. The principal advantage of this mechanism is that it provides for a sufficiently large, competent, and independent staff unaffiliated with any other Federal agency, and, therefore in a position to give to the President a thorough, professional review and analysis on all matters which pertain to the environment. Such new capability for expert advice should help to make the Legislative-Executive dialogue on environmental quality more productive. This office could be capable of helping the President develop and promote a national policy on the environment. In the Report of the Senate Committee on Public Works which accompanied the bill, the Committee stated ". . . The Committee

and the Congress are pledged to a national policy of enhancement of environmental quality, a policy based on the concept that man and his environment are interrelated and that a quality environment is necessary to the improvement of living standards for all men."

I believe that an unqualified political commitment must be made in each regional area, on solid waste legislation, air, water, and any other environmental concern. I would encourage the earliest expression of national policy in this regard. This national position requires the technical and intellectual resources of a competent environmental advisory group to the President. The new legislation (S.B. 7) contains the features initially required. Technicians, practitioners, planners, veterans of political battles, and, active administrators of functional programs of solid waste management, have a large stake in this bill. I feel certain it will, if enacted, prove a major factor in improving our ability to deal with problems of environmental management.

To many, the prospect for environmental control and environmental enhancement seems rather dim. However, we have some reason to hope; we have come a long way since 1955 when Congress first passed an extremely modest air pollution research program at the request of Senator Kuechel of California.

We now have a reasonable grasp on the nature and scope of our problems.

We now have laws which provide tools to control, abate, enforce, and manage.

We now have in large measure the technology that needs to be applied for solution.

We *don't* have all the financial resources required, and we *don't* have the management, control, and enforcement organizations we need to effectively implement our existing laws. These are, of course, deficiencies of no small order, but they can be overcome.

As we proceed, let us take note of President Woodrow Wilson's counsel that ". . . What really bends the processes of government is continuous, sustained and intense effort, generally uncertain at the beginning of what its exact final outcome will be, always responsive to the situation as it is, and continuously aware of the need to be on top of that situation, and not of some abstract plan of what it ought to be, or was when one once knew it, or would be if only the people in Washington had more sense."

WORKSHOPS ON SOLID WASTE LEGISLATION

All the workshops agreed that State solid waste planning should precede State legislation. Most of the workshop participants felt that a State legislative measure was highly desirable if not essential. As planning progresses, legislative requirements become clear, making it possible for legislative action, when undertaken, to be completely suitable. Legislation enacted prior to proper planning usually requires amendment or alteration. However, because action is urgently needed and because pressures come from many parts of the community, precipitate legislative moves may be difficult to avoid. Nevertheless, the need for planning should be emphasized.

In all the workshops there was consistent support for State solid waste legislation. The existence of a solid waste act improves administration of the program and strengthens the position of solid waste officials. If the question is asked, "Should a State have a solid waste management act?" the answer of workshop participants from most of the States would be YES

What Should the State Act Include

The workshops recommended that State solid waste laws should set policy and standards, but should leave rules and regulations to be set administratively. The law should include:

Definitions. Uniform definition of terms makes clear the responsibilities of communities; enhances understanding of the program; facilitates smooth relationships to other States and to the Federal government programs.

Designation of Authority. The act should outline the mechanism of procedure, indicate the groups or individuals in control, state how these officials should be appointed, and delineate the structure of State and local machinery.

Responsibility. Areas for State and local responsibility should be defined. A legislative enactment which is unenforceable or inapplicable is of little use. Enabling legislation is therefore preferred to regulatory legislation.

Standards. Some States prefer to leave setting of standards to the designated authority. Where standards are indicated in the

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law, they should be the basics to be expected of all jurisdictions, permitting more stringent requirements where localities wish to implement them. A State act should bring together and codify existing legislation to provide consistency. Guidelines (legislative or administrative) from the State capital are often of assistance to county governments, particularly where the political consequences of local action might be unfavorable.

Certification and Enforcement. A program of enforcement by enabling rather than directional authority is an important ingredient of State law. The workshops were agreed that improvement in waste management is difficult without a legal mechanism for enforcement. A state agency needs authorization not only to establish and enforce statewide regulations, but also to enforce local standards, rules and regulations.

Jurisdictions. The State law should outline areas for implementation and encourage regional applications. In most States regional agreements are legally permissible; however, others will require new legislation or constitutional action to permit the formation of solid waste regions.

The jurisdiction of the Federal government presents some problems. Large Federal installations, military bases or Indian reservations may not conform to State solid waste regulations. On the other hand, in some States the availability of public land has been an advantage in providing sites for landfills.

Manpower. Enabling legislation to permit the State solid waste authority to set manpower standards may be of significant help. Both counties and municipalities find that appropriate standards for selection of manpower, training and education of personnel, and inspection to assure competence make their job easier.

Esthetic Standards. The basis for most State solid waste legislation is health. There is a growing tendency to consider that esthetic standards should also be embodied in the law as a matter of principle. Such standards convey broad authority for dealing with industry, mining, private dumping, junkyards, etc.

Funding. Budgeting for solid waste management at the State level is crucial, for without funding the legislation becomes meaningless. Budgets may be for the State solid waste program, or may include technical assistance and grants to localities, and funds for public relations and public education.

Local Authority

When legislation has provided for designation of a State authority and its range of responsibilities, standards and regulations can be set by the State, leaving operation and administration of facilities in local hands. Effective control of such operation might be handled through licensing, inspection, training, matching grants, and similar devices. The workshops agreed that collection practices, types of containers, storage areas and details of operation should not be embodied in law, but should be left to local jurisdiction.

Administrative Regulations

Minimum acceptable standards should be set by the State, the workshops agreed almost unanimously, with varying additional requirements set by the State or locality for communities of different sizes. With near unanimity, the workshops agreed that open burning should be prohibited.

With policy set by law, and procedures and standards set by administrative regulation, the power of regulation may be vested in appropriate State authority. The ban on open burning, licensing of sites and facilities, conduct of training programs and similar activities by the State are handled in some areas by departments of health, in others by departments of natural resources, but there is a trend toward establishment of a State solid waste agency, possibly within the department of health.

Licensing may be carried out by the State or by county or municipality under State standards. In either case the workshops recommended that licenses be issued on a year-to-year basis. Revocation of a license may present more problems than nonrenewal.

Compliance with Standards

There was considerable discussion on compliance, ranging from the use of compliance bonds to the use of public education. There was general agreement that both the "stick" and the

"carrot" are necessary. Legislation can be a stimulus to effective public education, but opinion was divided as to whether it is feasible to have regulation for solid waste disposal precede community acceptance. Some observers feel that the regulations are futile if the community is not ready to accept them, while others feel that the communities will never be ready if regulations do not push them toward new attitudes.

Most of the workshops concurred in the concept of legislation and regulation, with a built-in time lag in enforcement to permit continuing educational efforts. For communities which may have difficulty in meeting new standards, lead time may be extended, but no community should be exempted from established standards.

There was all but total agreement that open burning should be prohibited, with designated disposal sites to eliminate this problem. Violators are therefore prosecuted not for open burning of solid waste, but for failure to operate sites conforming to State regulations. The workshops considered that open burning could be phased out over periods of six months to three years, with one year accepted by the majority as a feasible and practical time interval. This pattern was arrived at independently in each workshop.

The major cause for failure to comply is lack of funds. Answers to this problem were suggestions for grants or loans from the Federal or State government. Although there is considerable difference of opinion on this subject, low interest loans are apparently favored over outright grants. State involvement in the allocation of funds assists the State agency in enforcing standards.

Various sources of funds other than general taxation were suggested by the workshops: a tax or surcharge on products to provide funds for ultimate disposal of both package and product; establishment of solid waste management as a public utility with fees for service regulated by a utility commission, a tax on retail sales.

In the experience of workshop participants, compliance has been more effectively achieved through construction grants and loans, planning assistance and encouragement of regional programs than through punitive action against violators. The experience of water pollution agencies was cited as an example of the failure of punitive action to secure desired results.

The Regional Approach

The workshops felt that regional agreements should be encouraged, but not compelled, by the States. Solid waste problems can rarely be solved within a single municipality. Regional programs may be stimulated by financial aid, demonstration grants, assistance in planning, and by mutual exchange of benefits. They cannot usually be enforced against the will of local groups.

Reports indicated that most of the States have passed State Solid Waste legislation, others have such legislation pending, and regional agreements have been begun or are planned in many States.

IMPLEMENTATION OF SOLID WASTE MANAGEMENT PLANS

*Frank Bowerman**

To "implement" is to "put to work." But in implementing a solid waste plan, we may start from a premise that may or may not be true. In many instances, we may assume that we are starting with a workable plan, but since many plans are not workable, implementation may not be successful. Many studies result in a final effort which is not capable of implementation. We cannot accept as a premise that planning always produces a program which we can make work.

I think that one of the most satisfying things an engineer can do is to implement a plan. To make a study, then to see that study come into being by way of a report—that is a good experience. But when the report sits on a shelf and gathers dust—that is really discouraging. However, to have something created by way of an idea, to generate a plan that becomes a workable, viable operation is truly exciting.

I think one of the finest things that ever happened to me was to be given a broad responsibility in Los Angeles County, starting with the development of basic legislation, going on to studies, buying land, starting landfills, designing and constructing transfer stations, and seeing good programs evolve. It did not happen overnight. I started in 1949 on the basic plan for solid waste disposal in Los Angeles County, and it was not until 1956 that the plan was in operation.

A workable plan must incorporate the use of definitive and practical technologies. I have heard people talk about the use of nuclear energy, for example, as a method of disposing of solid wastes. Such a technique may become a practical certainty; solid wastes may not have to be burned or buried but may just be vaporized. However, the technology for that to become feasible is probably decades away. It is not a workable plan for today. Laser energy is another proposal—taking a beam of light, flashing it on a tin can, and—poof—causing it to disappear! That is not yet a

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workable technology. We cannot put to work plans for which a technology is not certain.

However, I will mention two technologies now being developed which appear to have possibilities, although they may not pay off quite as immediately as one might hope. One is dense compaction. This technique has been used for about ten years in Japan and for three to five years in the United States, but it has not been applied on a large enough scale to give us a final determination of maintenance costs. We do not yet know whether this is a dependable day-in and day-out method. A solid waste disposal system has to cope with a "stream" that is never shut off. The tonnages keep coming in and the system has to be able to operate whether the machines are working or not. I look on dense compaction technology as still in the developmental stage.

"Rail haul" is another important new technology, depending largely upon dense compaction. It is manifestly easier to haul "coal" instead of "feathers." Therefore, dense compaction can make a rail disposal system practical and workable. The system must be designed around a specific responsible operator, a governmental authority, a private contractor, or a mixture of the two.

A good many sound technical plans remain on the shelves as "unworkable" because the question, "who is to do what?" has not been resolved. Bickering and fighting in the division of responsibilities has thwarted the implementation of many programs. In my opinion, it is the responsibility of the planner to define the responsibilities and spell out the division.

The system, to be workable, must also be compatible with the technical capability of those who are going to operate it. Many incinerators that probably could have been operated without pollution of the atmosphere became serious air polluters because of poor operation. Operation is often a more difficult problem than design. Even with the finest control technology, poor operation would still make the stack discharge totally unacceptable. Again, the study plan should indicate the level of competence required to operate the programs. More is involved than accepting any personnel that may be available.

Much credit is due the Public Health Service for offering training programs in a number of fields: sanitary landfilling, incinerator operation, and solid waste management system design.

An engineer working in the sanitary field with water and air pollution problems cannot become a solid waste expert overnight. This is an area of specialty that requires a certain degree of understanding, and the Public Health Service training programs are an excellent means of producing such understanding. Many communities seem to assume that to make the transition from an open burning dump to a sanitary landfill all that is needed is to hire a new engineer. However, the big pieces of equipment used at landfills are not easily handled, and lack of knowledge can be dangerous and even fatal. At several landfills, men operating bulldozers have been killed through failure to recognize that part of the refuse was hard and unyielding, causing one track to remain high while the other falls into a soft spot. The bulldozer rolls over on the operator, crushing him. The system must be planned to include the training of people to make them capable of safely operating equipment under new and varying conditions.

It is also necessary to face the fact that the plan must be politically sound. Engineers do not like the word "politics," but politics, in the highest and best sense of the word, is a necessary and vital aspect of implementation of a solid waste management program. The elected official and his professional staff attempt, to the best of their ability, to translate the needs and desires of the community into workable operations. The engineer who thinks he is smarter than the politicians, that he can develop a system without considering its effect on people and their habits, is going to fail. The system, if it is to be sound, must be acceptable to the politicians. A plan compatible with sound engineering and popular appeal will be successful. The political leaders may even be convinced by the engineer that they gave the engineers and planners the idea in the first place.

From experiences in a number of cities, I have found that people from many walks of life do have ideas that can be incorporated into solid waste planning. Often the ideas are good and lead to an exchange of thinking. The consulting expert often puts together a system that comes from the framework of local thought. This is good engineering.

For example, a solid waste planner in an area with a severe air pollution problem would be in trouble if he tried to implement an incinerator program. The situation may change, but at this time selling incinerators in certain areas of the U.S. would be

difficult. A program designed to implement that kind of an operation might be doomed beforehand.

In an area where the only suitable landfill sites are those that have natural beauty, such as meadowlands or natural game reserves, the conservationists may defeat landfill plans. From an environmental point of view, some sites are more important as they stand. San Francisco Bay is a good example. The Bay Area Conservation and Development Commission has simply placed a "Stop Order" on all filling of the Bay. The decision has nothing to do with the economics of waste management, but is concerned simply with preserving San Francisco Bay for posterity. A proposed system that did not recognize such a basic factor would be a useless system.

On the other hand, the possibilities for implementation of a solid waste management plan can be enhanced if we take advantage of the things that people and politicians like and then build toward them. For example, in Los Angeles, good support was obtained from the Regional Planning Commission and from the Department of Parks and Recreation for landfills that were designed to become part of the park system. So they were designed that way. We never had to convince Los Angelenos of the desirability of landfills. We sold five "parks." In considering the political ramifications of a plan, consideration should go first of all to those aspects that are for the general good.

The engineer can develop political support for a solid waste management program; this should be part of the implementation action. The political decision-makers are vital to the implementation of a program. At least once every three months during a study program formal presentations should be made to the top political decision-makers and their staff. This can often be combined with public meetings. The political leaders are thereby kept informed and they help the public to understand what is to be done through the solid waste management study. Through charts, graphs, and visual materials, the experts can interpret the plans, so that the final report will not be a surprise. Government leaders, like the rest of us, do not always appreciate surprises. They like to be included in the planning so that they can understand what is being done and be prepared to act on it.

In addition to quarterly review meetings, it is helpful to contact the decision-makers individually at any critical decision

point. If a planner is contemplating a county-wide anti-burning law, he cannot feasibly recommend such an action until he has the support of people who will have to carry out the mandate and take the criticism of the ban on open burning.

Timing may be important. Perhaps a ban on open burning might be acceptable at a later time, possibly after an educational campaign or in a period when an election campaign is not pending. Understanding of the goal is important, but an elected official must also consider how a decision will affect him.

In addition to informing the elected officials, the solid waste planner must also inform the public works director, the city engineer, and the public health officials. There is also a need to go to the public directly—preferably before the fact rather than after the fact. If word of a landfill in a particular area is rumored, it will be too late to generate public support for the idea. By that time the local population will have generated an opinion which will harden like concrete. The vote of organized people at that point may well defeat the plan.

Since landfills, incinerators and transfer stations always have to be located *somewhere*, it is a good idea to find out beforehand the key people in the neighborhood. The really key people are usually just a handful. At most, 200 to 300 people in any neighborhood are really interested enough to take a position for or against any proposal. If the plan is clearly and honestly presented to organized neighborhood groups and their leaders, support is usually forthcoming. If they are asked to permit a presentation to their group, they will often be quite willing. I would say that probably 90 percent of the general public will listen, while 10 percent already have their minds made up. Of the people who listen, about 75 percent will agree if the argument is reasonable. Groups can be addressed at the local high school or civic club; people then become involved and the groups have an impact in favor instead of against the program.

Most people think solid waste management is important. We should take advantage of this fact. Nationwide television programs have helped. There is a strong new interest in the techniques of solid waste management. Positive information can displace rumors and can provide a stimulus to effective public action. Newspapers, television, and radio are all alert to the problems of solid waste management. If they are given material of interest to readers and

listeners, they will want to know more, and will probably give more attention than expected. They are usually fair in their reporting and effective in interpretation.

The final stage of implementation comes when a workable plan has been developed, when it has been accepted by the political decision-makers, the professional staff, the people of the local area and the general public. Implementation requires building something. It may be a landfill, where roads must be constructed, fencing installed, water and fire protection facilities set up and equipment purchased, or an incinerator. But something else is necessary before one can consider a plan implemented.

The job of the solid waste professional includes a blueprint for proper environmental protection. A study which merely states that a transfer station should be built at a particular location is incomplete. Depending on the selected location, the plan should state whether or not the station should be enclosed or open; whether it is to be a direct dump or have mechanical equipment. People want to know more than just the fact that there is going to be a transfer station at that site. They want to know what it's going to look like, what it is going to sound like, where the trucks will go, what the problems will be, etc. These considerations should be a part of any workable plan.

Sometimes in the construction of an incinerator or a composting plant, an important phase is left out. This is the phase of "checking out" or "debugging." It is important to retain at the functioning operation the professional who was involved in constructing the equipment so that he can follow the operation through. Checking out or debugging the equipment is essential.

The effectiveness of implementation of a solid waste management plan is finally in the hands of the people on the job, from the supervisors to those who are charged with the responsibility for running the equipment. If they can be inspired with a feeling of confidence; if they can believe they are "not just garbage collectors," if they can have good training programs, if they can be adequately paid, the entire solid waste management system will work.

"With a little bit of luck" and a liberal application of good judgment, this may all come to pass.

WORKSHOPS ON IMPLEMENTATION OF SOLID WASTE MANAGEMENT PLANS

What is Implementation?

Implementation is the process of activating recommendations. Most of the States have collected data on solid wastes and are well into the planning stage. Some States have enacted legislation for solid waste management. Very few have progressed to statewide implementation programs. The workshop participants were agreed that planning should provide for priorities based on needs so that implementation can proceed in orderly fashion. Two basic prerequisites were expressed: authorizing legislation and adequate public relations. Legislation enables the plan to be carried out; public relations makes it possible to do so effectively.

Some States favor county solid waste programs coordinated into an overall State plan. Most States, however, regard State planning and State legislation as sources for county direction. All were agreed that implementation cannot wait for planning to be completed, and that planning cannot stop when implementation has been begun. Both steps continue, planning being modified in the light of experience and implementation changing with new forecasts and developing technology.

Since the success or failure of any plan is realized when it is put into operation, the ingredients for operation must be present if success is to be the result: staff, equipment, funds and authority. Without these, the best-planned legislation will fail.

Implementation and State Law

Most of the workshops agreed that legislative adoption of a State plan is the vital step in implementation. State legislation should include a statement of objectives; authority for setting standards; designation of a responsible management; provision for public relations, research, technical assistance, certification and inspection; and budgeting for these purposes. Such legislation has already been enacted in some States and is pending in others. In many cases, however, implementation of specific aspects of the State solid waste plan have proceeded in advance of legislation under other types of enabling authority.

No nationwide pattern of practice emerged from the workshops. Many different kinds of State activities were described, some prevalent in many areas, some in very few. A sampling of State functions in the field of solid waste management includes the following:

1. Encouragement is given to counties, localities and municipalities to develop local and regional plans.

2. Technical assistance is afforded to counties in handling solid waste management problems.

3. Standards have been set for sanitary landfills and requirements have been established for treatment of leachate.

4. Controls have been set on open burning, extending in some States to agricultural wastes.

5. Training programs have been offered for operators and demonstration programs have been arranged by equipment manufacturers and successful site operators. Other training efforts have been made through assignment of personnel to courses offered by the Public Health Service and by universities.

6. Certification and licensure have been required for sites and operators.

7. Regular meetings of State and/or county personnel are held.

8. Sites are inspected and standards enforced, sometimes by police, sometimes by sanitarians, sometimes by volunteers.

9. Grants are provided for construction of facilities, for trial operation or for demonstration projects.

It should be emphasized that all of these measures of implementation were mentioned in the workshops, but no State has all of these. One workshop discussed direct State ownership of facilities and another discussed the formation of a State-controlled non-profit corporation for solid waste management, but these were mentioned as possibilities not as actualities.

Local Implementation

Solid waste disposal has traditionally been a local responsibility. It is only in very recent years that ecological problems

have received wider attention, involving Federal and State interest.

The difficulties in local implementation as reported to the workshops were: (1) authority boundary lines; (2) lack of public understanding; (3) unavailability of consulting engineering firms in some localities; (4) the tendency of consultants to recommend incinerators, on which profits are greater than in landfill operation; and (5) the credibility (or lack thereof) of equipment salesmen.

Because of the nature of the solid waste problem, implementation cannot stop while planning is going on. As a result the plan must encompass existing programs and can serve to improve and develop such programs even during the planning process. Problems are manifold—money, personnel, site location, public relations, the presence of Federal installations, community zoning boards, the ownership of land, the conflict of jurisdictions, and the nature of specific wastes. In spite of such problems, and in spite of the view of some workshop participants that counties should be urged to hold up implementation until State action had been effected, the overwhelming majority of the discussants felt that such delay was impossible.

Local plans must provide for alternative service in emergencies, whether these result from natural disasters such as floods and earthquakes, or from manmade situations, such as strikes.

Some practical public relations devices were suggested to improve popular understanding and to speed implementation of programs: counting flies at dumps; picturing the ugliness of existing methods; reporting accidents and deaths; and emphasizing health hazards of dumping.

Even after the problem is recognized and the solutions developed, however, support for a system of solid waste disposal may run into serious budget problems. Local taxes are already burdensome and a taxpayers' revolt in many parts of the country makes addition to these taxes a virtual impossibility. The workshops suggested financing through fees for service, public utility management, taxes on retail sales, and similar devices as substitutes for property taxes.

The feeling of all the workshops was that solid waste management is technically feasible, and that implementation of solid

waste plans is more likely to be impeded by public misunderstanding than by technological inadequacy. One workshop summed up its views in Abraham Lincoln's words:

> "Public sentiment is everything. With public sentiment nothing can fail; without it nothing can succeed. Consequently, he who molds public sentiment goes deeper than he who enacts statutes or pronounces decisions."

THE LIGHT AT THE END OF THE TUNNEL

*H. Lanier Hickman, Jr.**

There are always inherent dangers in summarizing a meeting: there is a tendency towards sentimental partiality to one's program and one's colleagues; there is a tendency to avoid objective summation and analysis in favor of pats on the back and approval all around. The stage for this meeting in September 1969 was set in September 1966 when we first met to discuss solid waste planning. At that time, few of us knew what we were doing or what we were going to do. Today we know our purpose and our direction, but some of us still do not really know what we are doing or what we are going to do.

Senator Boggs' keynote comments about the great solid waste industry were most pertinent. His review of legislative plans contains important implications. The bills now pending in Congress will have far-reaching effects on current solid waste management and will shape the direction of the future.

Mr. Roberts discussed the basics of the planning process. His listing of "don'ts" is worth repeating: (1) don't overlook any aspect of solid waste management: (2) don't get data happy; (3) don't keep a closed mind; (4) don't forget interrelationships; and (5) don't reinvent the wheel.

During the workshop sessions following Mr. Roberts' presentation on planning, different groups tried to relate the discussion of planning to the do's and don'ts. Some groups concentrated on problems of planning while others concentrated on problems of solid wastes. It was difficult for the participants to discuss the planning process objectively because of their varying experiences and the stages of plans in their States. The Bureau of Solid Waste Management has provided a guide to planning, to stimulate (not direct) the planning in each area. The planning process is an aid to decisions-making and not a panacea for all our problems.

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Mr. Weaver set the stage for a discussion on the data needed for solid waste planning. He stressed the broadening of our data base by studies of those aspects of solid waste management not covered during the first national survey. He pointed out the need of data for systems design, which the national survey did not provide. I submit to you that the development of systems design data *is not necessary* to effectively plan a State solid waste management program.

In the workshops there was no consensus on how much data collecting is enough. This confusion probably arises because we fail to remember what the data are being collected for. A State solid waste management program must deal with the broad problems and cannot usually develop operating systems for specific areas. Although in certain cases precise surveys may be useful, we should not normally be developing action program data at the State level.

Mr. Healy described the interrelationships of government and solid waste management, emphasizing the roles of each level of government and the need for cooperation. Division of responsibilities simplifies the problem of data collection and the development of solid waste management plans.

The workshop sessions on intergovernmental cooperation indicated clearly that cooperation with other agencies is not at a commendably high level. It is discouraging that some solid waste management officials have not yet established a formal interface with other agencies and particularly with the official planning agencies of State government. The major point to arise out of this session was the need for strong public involvement in the problems of solid waste mangement. Active, aggressive, and innovative programs are needed to elicit public interest and support. Although some agencies are doing good work in this area, *much* more needs to be done.

The session on planning progress contained several points of interest. Too many agencies are trying to collect too much detailed information. Although each agency can best judge what it needs, it is important to remember that we are trying to define the problem and develop a plan to solve the problem. Precise design figures are not necessary.

Few of the agencies which have received drafts of our planning guidelines have studied them. It is not necessary to follow the guidelines precisely, but they do indicate the depth needed in a plan. Essentially a plan should be designed to serve the needs of the State. The concept of regional systems is the keystone to effective management programs and we must constantly press this concept.

Strong public information programs are an essential element in both the planning and the implementation phases of solid waste management.

Additional information on industrial and agricultural solid waste is needed to supplement the existing data. However, except in a few areas, a management plan may be developed on the basis of the national survey, with further information added later. National survey data are adequate in most instances to develop a plan. What is required is the imagination to look at it. Stop trying to keep refining it. In any activity minor faults can be used as excuses to delay the development of a plan. In spite of these points, the job can be done and we are making progress. We must not slacken our efforts just when we are nearing the completion of plans in many agencies.

Mr. Mields discussed the relationships of legislation and solid waste management. Something more than mere cooperation is needed to get the job done. Strong laws and consistent enforcement are essential to effect adequate solid waste management programs. In the workshop sessions the variation in solid waste legislation was discussed. Some agencies now have broad enabling legislation that will allow implementation of their plans, while other agencies have no legislative basis for being in the solid waste business and rely on executive favor. A good basic solid waste management act is needed if programs are to progress.

Mr. Bowerman described what it takes to implement a plan. It is significant that the implementation of a State plan is not greatly different from the implementation of a local plan. The same knowledge, preparation and action are required. In the workshop sessions many people expressed their doubts about being able to implement the plans they have been working on. However, I think the doubters underestimate themselves and the people of their States. Implementing plans begins, like the longest

journey, with a single step. It is important to start, to take that first step, and then proceed with each item in the plan.

Three years ago in September 1966 the Bureau of Solid Waste Management started the States in developing plans. Although at times that aid and assistance may not have been totally effective, every State has received some planning assistance. It is time for the other end of the bargain to be completed and for the States to develop and complete the plans so desperately needed. The plans are vitally needed so that the next steps in solving our solid waste problems can be taken. Implementation cannot proceed without planning.

This Symposium has given us an assessment in how far planning has progressed, where the problems are, and what can be done to implement our solid waste management plans. Although there is some reluctance to saying how long the job will take, it is clear to all of us that we have begun it well and can see the way toward its completion. We see the light at the end of the tunnel.

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